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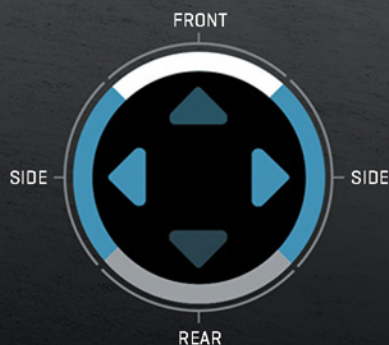


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Okay, so it's
a Shelby Mustang.

*photography by
Greg Pajo*

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2017 PORSCHE 911

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WHAT I'D DO DIFFERENTLY

Connie Kalitta.

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ADVENTURE PHOTOGRAPHER

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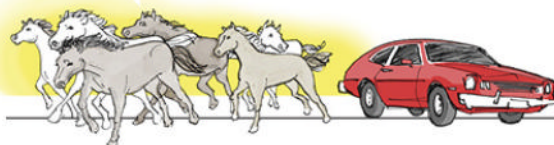
 **Hankook**
driving emotion

backfires

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02.2016

□ hosted by E.D.



Sic your dogs on us at:
editors@caranddriver.com
 or join the discussion at:
backfires.caranddriver.com



THE KING'S HORSES

Aaron Robinson seemed more concerned with his cute alliteration, “prancing pinto,” than the confusion created by the mere mention of one of Ford’s worst models ever [“Knocked Flat,” November 2015]. Never have I heard or read of the iconic, galloping steed referred to as a Pinto! Heck, even the four-legged mustangs wouldn’t permit a pinto to run with them.

KIT HOLDZKOM

PALM DESERT, CALIFORNIA

Intended Ferrari reference aside, from 1974 to 1978, this iconic, galloping steed was indeed a lame Pinto—Ed.

Your November issue mentions that the new Ford Mustang Shelby GT350 is the first volume use of carbon-fiber wheels. The 1989 Shelby CSX, which you, incidentally, also tested, had Motor Wheel’s Fiberride wheels as standard. Were they carbon or what?

RICHARD EHRENBURG

MOPAR ACTION MAGAZINE

MARLBORO, NEW YORK

Citroën delivered a few Michelin-made composite-plastic wheels in the 1970s. The ’89 CSX’s 15-inch wheels were made of compression-molded fiberglass. They were only two pounds lighter than the 19-pound aluminum wheels they replaced and didn’t catch on—Ed.

So I have a friend who has worked at a Ford dealership for years call me up and ask if I want its single allocation for a GT350. He said I had a week to decide. I wanted the car, but I’ve made irresponsible car purchases before that nearly cost me my marriage. I labored over the decision until the last night, when I’m making a run to the grocery store. I’m about to text my friend that I’m going to pass on the car, when there is your cover story on the GT350.

“Is this a sign?” I said aloud, which fetched an awkward glance from a lady reading the tabloids. Needless to say, I sent a different text to my friend. My Avalanche Gray GT350 with a Track pack and black roof will be here in early spring.

Thanks for being my Nostradamus.

ZACH TAYLOR

ATLANTA, GEORGIA

I predict you’ll soon be flying Delta and drinking Coca-Cola—Ed.

I was talking to a salesman at my local Ford dealership about the 2016 Mustang Shelby GT350. At this point, I don’t care about the performance. I want one just because of the engine sound! He said the word on the street is they will be going for \$10,000-plus above the sticker price, and don’t expect to find a base model. Its allocation is one. Just saying.

MIKE PEDERSEN

NORTH BERWICK, MAINE

I could not help but be astonished at the GT350’s biblical proportions. The “car’s flat-plane-crank V-8 delivers 8000 revelations per minute.” The book of Revelation has met its match!

JOHN JAFFEE

NAPLES, FLORIDA

HERE TO COLOMA

I’ve often wondered how much Garbage Motors pays you guys for the reviews [“From Tacorado to Eternity,” November 2015]. Got some kind of

bromance going? So, the Toyota has a nifty tie-down system and power in the bed, while the Chevy doesn’t even have a bedliner?! And the Tacoma has better interior materials. Yet no bonus points for either in your ratings. I wouldn’t doubt the GM has a better ride, but the Toyota is rigged for off-road use. And I know which one, after 100,000 miles, will be like a rock, sitting in the shop getting engine and other seals replaced. The Toyota may have lost in some areas in your comparison, but I know I’d rather have it in my driveway.

BRIAN HAWES

LEBANON, OREGON

With regard to your mid-size truck comparison: Butted up against the Chevy Colorado, the Toyota Tacoma is a TRD!

JAY KOLLIN

BETTENDORF, IOWA

I guess by the rules or measurements, these trucks are considered “mid-size,” but to the eye they’re both *huge*. How long will the industry continue to let the power vacuum that is the small-truck segment go unfilled? Any small truck, any small truck at all, would have no competition right now. Someone please step in and own it. There’s monopoly \$\$\$ to be made.

BRANT LOUCK

BROOKLYN, NEW YORK





LETTER OF THE MONTH

As a former Pontiac engineer who went through the CPC transition/takeover (Pontiac was silent in the “Chevrolet-Pontiac-Canada Group”), I think the editor’s comments about automotive passion are right on target [Editor’s Letter, November 2015]. The internal flames that burned strongly at Pontiac into the mid-1980s were gradually extinguished as financiers and marketers replaced car enthusiasts at the helm. The feds finally put Pontiac out of its misery. In reality, the real Pontiac, the innovative, risk-taking, enthusiast-driven division of General Motors, had died several decades earlier. Merging FCA with GM would be a death knell for the creative Chrysler/Dodge/Jeep crew in Auburn Hills. A “Hemi-less” 300, a Ram 1500-badged Silverado, a Jeep Rubicon Special Edition with two-wheel drive and chrome wheels? No thanks.

GREGORY E. PETERSON
SYLVAN LAKE, MICHIGAN

editor’s letter

As the Volkswagen diesel scandal blankets the industry like so many, well, carcinogenic particulates, the doom has begun to encroach as far as my own garage. And I’m pissed.

Careful observers of this space—Hi, Dad!—will recall that I spent my own dwindling funds to outfit my wife with an Audi Q7 TDI. Its 3.0-liter V-6, we were told, was safe from scandal. But now the EPA is claiming, under its widening investigation, that 3.0-liter-equipped Audi, Porsche, and Volkswagen diesel vehicles are also noncompliant. While our Q7 used to be true blue, the soot-stained vultures are now circling.

I shouldn’t get emotional about it. The EPA emissions tests are bitterly divorced from real-world behaviors; they are chiefly a way to control for key variables such as weather, speed, etc. All vehicles, whether diesel- or gas-powered, emit more than these compliance tests measure. And I understand that the current American smog standard is expensive to meet (even if it’s cheaper to clean up sources of pollutants than a trashed planet). Let us also not ignore the vastly higher emissions limits for big trucks, which outnumber diesel cars like the French at an automotive Agincourt. It’s as if the EPA doesn’t want us driving diesel cars, despite their suitability for our roads and driving patterns. With their turbocharged torque, higher mpg/reduced CO₂, and bladder-straining range, they are, for most American drivers, a better solution than EVs—vehicles that pull, on aggregate, about 40 percent of their electricity from coal.

There is the professional embarrassment, of course. I’ve recommended these cars to a wide circle of friends and readers. I’ve bought them because I believe diesels are smart, brimming with personality, and wonderful to drive. The Volkswagen TDI captured the spirit of the original Beetle as it existed in Americans’ minds; it was the antiestablishment voice against a chorus of ’50s Yankee land yachts. VW was wise to position the TDI as the modern core of its brand here, for it’s an echo of the lovable, iconoclastic Bug, the car that embodied the notion of a better way and began America’s blind love affair with cars from Europe.

We should have asked more questions when VW told us its four-cylinder oil burner was clean enough to pass emissions tests without elaborate NO_x clean-up systems. But we don’t test regulatory claims; even the EPA can’t afford to verify all vehicle emissions. Though I may be getting what’s owed to me, it’s the technology that takes it hardest. It has been redemonized. It’s likely that this episode could spell the end of diesel cars in the U.S. That’s why I’m pissed.



Eddie Alterman

EDITOR-IN-CHIEF

You guys are pussies and don't know anything about trucks. Why do you embarrass yourselves by writing about them? Trucks are about work and durability. The fact that dandy "want to be tough" cowboys buy trucks to compensate for their shortcomings is not relevant. Even so, you compare a squishy Colorado to the TRD Off-Road version of the Tacoma with off-roading tires and declare the Colorado better driving and a more comfortable ride. Get a car, for Christ's sake. The only things you pussies will ever put in the back of the Colorado with no liner or tie-downs are bags of groceries. I've owned five or six Tacomas throughout the years as a contractor and farmer. The real weakness of Tacomas is the rear springs. But that doesn't matter to pussies who never use the bed anyway. I have a 2009 Tacoma with an extended cab and all-terrain tires, and its ride quality and comfort exceed most of the cars I have driven. I appreciate your recently discovered devotion to the "American" car industry—calling it American allows us to include Mexican-made—but you don't know anything about trucks. They are work vehicles and should be judged as such. In 2040 there won't be a Colorado on the road. Otherwise C/D is a great mag.

STEVEN A. JUDGE
ROYALTON, VERMONT

Meow—Ed.

Quit being so outright biased in your comparison against American cars and trucks, because I did not expect to read on page 59 in the November 2015 comparison between a Toyota Tacoma and a Chevrolet Colorado, "By 2040 we should know if Chevy has caught Toyota in quality, too." What a bunch of *bull*. GM has caught Toyota and leads the way! Stop being biased and prejudiced against American vehicles, just test the vehicles and keep your opinions to yourself. I just need to know how the vehicle performs under all conditions. I do not pay for opinionated writers who cannot tell the difference between the oil dipstick and the transmission dipstick.

PHIL
IN MICHIGAN

TRACKING PROBLEMS

Ugh god. That was painful ["Jumping the Tracks," November 2015]. What a long, laborious introduction to the Audi TT road test. I had to take a break and write this letter to get away a little. A mishmash of random, contrived, and forced metaphors, allegories, similes, synonyms, and scenarios. There was no rhyme or reason to that particular assemblage (ingot and fistful of beer?). And, after all of that disjointed randomness, we get to the belabored point: The TT has a lot of aluminum in it. Got it.

But I'm done reading. It has come to be that I wince uncomfortably when I see anything written by Jared Gall. And this TT intro was among his most egregious yet. Now, to quickly find an Aaron Robinson piece and rinse out my reading eyes.

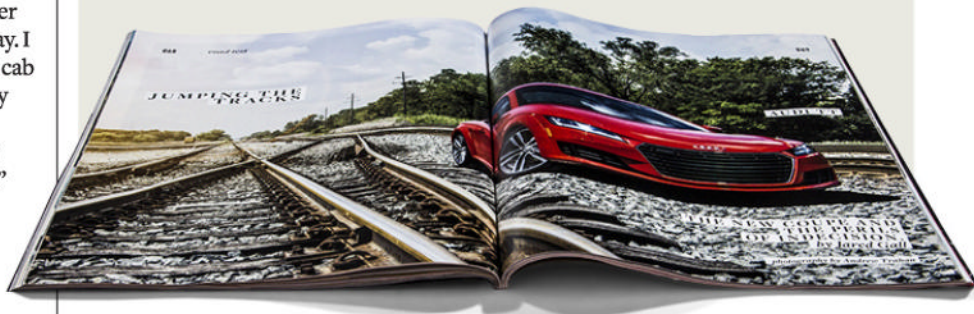
MARK KHOURY
MONTREAL, QUEBEC

Railroads operate on their own rights of way and thus are private property. I assume Andrew Trahan had permission to photograph the TT on the railroad's property? If not, too bad a 200-ton locomotive didn't teach him a lesson.

TOM SIMPSON, PRESIDENT
RAILWAY SUPPLY INSTITUTE
WASHINGTON, D.C.

Your Audi TT photo is tasteless, illegal, and dumb, dumb, dumb. Take a major railroad setting, add an Audi TT (with ground clearance unable to drive over rails), with the photographer positioned to be killed by a passing train and what results? Nothing but stupid trouble with no redeeming social value. What say you?

TOM STOERY
ARROYO GRANDE, CALIFORNIA
You only assume we don't know what we're doing—Ed.



I used to read this magazine all the time, and then kind of got out of the habit, and in July, resubscribed. Boy, am I sorry I did! Take, for example, your article on the best mid-size pickup. You did not test two equal trucks, as they were both optioned differently, and you essentially ignored the Nissan Frontier. Then, the story was too short and too damn boring. Please cancel my subscription to your very lame magazine.

HARRY MITTS
EASTERN NORTH CAROLINA
So it's true what they say!—Ed.

HAIL BRITANNIA

Nice article on the Isle of Man ["Britain's Most Brutish," November 2015]. However you incorrectly refer to the TT race as the Manx. The TT and the Manx are separate events held at different times of the year. The TT is for professionals, and the Manx is for amateurs. If you have raced in the TT you cannot compete in the Manx. I raced in

the TT in 1982, and it was one of my greatest experiences.

MIKE ROSS
FAIRFIELD, CALIFORNIA
This is what happens when car folk write about bike events—Ed.

PAPER CHASE

You guys need to talk to each other ["Old School," November 2015]. After reading that "Lincoln has its sights on the Japanese, generally, and the Lexus RX, specifically" and a disparaging remark about those "torn between a BMW and an MKX," what do I find in the "competitors" list? No RX. Yes X5. So did Lincoln hit its target? Who knows? I don't! Maybe the guys putting together the competitors list ought to read Eric Tingwall's piece first.

LARRY NEUMANN
LANCASTER, MASSACHUSETTS
Tingwall did both. The RX350 wasn't included because we haven't tested the redone 2016 RX350, and comparing the

new MKX to a now-dead model would just confuse you more—Ed.

Just read your Lincoln MKX review—I laughed out loud at the toilet-paper jokes. I think I'll keep renewing my subscription.

JOHN MUELLER
SOUTHFIELD, MICHIGAN

In his review of the new Lincoln MKX, Tingwall says, "No one is going to pay you to drive a Lincoln." He is wrong. I recently received in the mail an invitation from a nearby Lincoln dealer to test-drive a Lincoln in return for a \$100 gift card. I declined. Why go through all that bother to drive a car that I would never buy under any circumstances, for a mere \$100? I would have done it for \$1000. Probably.

ED REGIS
SABILLASVILLE, MARYLAND

HADOKEN YUKON

I was amazed to read the rants and raves column about the GMC Yukon XL Denali ["Moving Mountain," November 2015]. Two comments, from Jeff Sabatini and Nathan Schroeder, whined about how massive this thing is.

If my mother were still living, maybe she could offer some advice to these two. She parallel-parked (never scuffed a whitewall or scored a wire wheel cover) and backed her 1984 Buick Electra Park Avenue in and out of a nine-foot-wide garage door for eight years. It was three inches shorter and 4.3 inches narrower than the Denali, and it had no park assist or backup camera.

EDDIE PETROZZI
IMPERIAL, PENNSYLVANIA

MOVEMENTARIANS

So the Scion iM = Scion bM [Drivelines, November 2015]? That stinks.

PAUL RUBIN (NOT PEE-WEE HERMAN)
JOHNS CREEK, GEORGIA

Mr. Herman, your scented letterhead gives you away every time—Ed.

BENTO BOX

I'm just not sure I get where Bentley is going with the Bentayga ["British Chasing Green," November 2015]. Once I figured out how to pronounce it, my brain for some reason retrieved an archival image of the 6000 SUX from *Robocop*. Is this car just

trying too hard? Maybe after having too much bad Cristal, a pimped-out Chrysler 300C mated with a VW Touareg and birthed a crossover whose bulging rear end would make J. Lo and that Kardashian jealous. On the other hand, the rich are eccentric, and nothing says eccentric like dropping 200 grand on this oddball. Maybe next time VW will let designers from Audi or Lambo have a little more say.

CHARLIE PICK
NORTHFIELD, ILLINOIS

Your puff piece on the Bentayga was amusing. It's a Porsche Cayenne with your grandmother's hips and cathouse quilting on the inside. Dürheimer's comment should read, "No other SUV will suffer this unique complexity."

JOHN BROMER
EASTON, CONNECTICUT

OF MONSTERS AND CAYMAN

From your review of the Porsche Cayman GT4 [Drivelines, November 2015]: "The six puts out a big 90 decibels at full whack. Don't worry, though; it's a pleasant sound, never annoying."

As long as you're not annoyed by the fact that 90 decibels is loud enough to damage your hearing.

PETER RONAI
SALEM, OREGON

What?—Ed.

CHOPPED

I am curious to know why the Infiniti Q60 convertible was not included in the "Wind Damage" article by Jared Gall in the November 2015 issue.

OMAR SANDOVAL
CORONA, CALIFORNIA

We omitted the Infiniti Q60 convertible because it's dead for 2016—Ed.

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. backfires

COLLABORATORS

I just read Alterman's column on Sergio Marchionne's take on corporate merging in the car business [Editor's Letter, November 2015]. Eddie, you are spot on. Remember when GM trimmed its divisions? It lost brand loyalty and customers, and it never recovered.

TOM LEIH
INTERNET ISLAND

WAITING GAMES

I'm trying to figure out why John Phillips spent so much time and money trying to interview Robbie Knievel ["Silence in the Garden of Evel," November 2015]. Just what does Evel Knievel, much less Robbie, have to do with cars?

GERRY FISHER
ST. LOUIS, MISSOURI

That's what we were hoping to find out—Ed.

LANGUAGE ARTS

Your in-your-face arrogance toward readers who object to F-words is beyond even those words. Too big to fail, are you? You criticize car companies for ignoring consumers, but look at you. I'm done with your arrogance and disregard for the very people who allow you to exist. You've taken the first step downward.

GREG LEE
NEWBURY PARK, CALIFORNIA

What's with these pearl-clutching geriatrics whining about the use of cuss words in your Ice Cube interview [Backfires, November 2015]? Might I suggest some Miralax to help relieve their obvious constipation issues? Excising profanity out of an Ice Cube profile makes about as much sense as censoring an episode of *The Sopranos*. Don't like it? Don't fuckin' read it!

JEFF KIRK
AUSTIN, TEXAS

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• REVEAL OF THE MONTH

Miatas Gone Wild

MAZDA SHOWS OFF A NICE PAIR. *by Jeff Sabatini*

THERE'S NOTHING SUBTLE about the Miata-based Speedster and Spyder concepts Mazda built for the 2015 SEMA show. The Speedster is a grab-the-Sawzall-and-cut-your-way-to-lightness exercise that would make a gastric-bypass surgeon proud. The Spyder, for its part, achieves exotic status by flaunting its own impracticality. Neither car has side windows, and neither is an original idea; the previous-generation MX-5 spawned similar concepts, the Superlight at Frankfurt in 2009 and another Spyder at SEMA in 2011. Yet because they are Miatas and we are red-blooded auto enthusiasts, we cannot look away.



THE SPYDER'S PRETTY, BUT IT'S ONLY 8 POUNDS LIGHTER THAN THE LAST MIATA WE TESTED.

BELOW: RACING BEAT DEVELOPED THE CENTER-EXIT EXHAUST; MAZDA DESIGNED THE TIPS.



EXTERIOR

The Speedster quite obviously tips its hat to those racing machines from the era in which men actually wore hats. Gone are the A-pillars, windshield, and convertible top, supplanted by a carbon-fiber front deflector and a hard tonneau cover under which two helmets can be stored. Also excised in the name of lightness: the infotainment screen and audio system, including the speakers. Lighter components replace the stock seats and inner door panels for a total savings of about 250 pounds, according to Mazda.

The Spyder swaps the factory folding roof for a bikini top developed by ASC. While it might look like a simple piece of canvas, there's actually a rigid panel sewn into it. The top uses the factory latching system at the windshield header, with further attachments inside the trunk. Closing the trunklid tensions the buttresses and secures the whole assembly. Unfortunately, this prototype top does not fit in the trunk, at least not yet.

INTERIOR

The Speedster's cabin is tricked out with plenty of suede and leather. Carbon-fiber door panels drop 1.5 pounds from the stock plastic ones, and the leather straps that replace the handles are auto-show porn. Japanese seat sup-

SPYDER



MAZDA CALLS THE SPYDER'S COLOR MERCURY SILVER. THE SPEEDSTER WEARS BLUE ETHER.

upfront

□ edited by JARED GALL

★ SUPER-DUPER LIGHT

The first time Mazda went down the “add lightness” path, it showed the Mono-Posto concept, a single-seat version of the second-generation Miata, at the 1999 SEMA show. This was followed by the Superlight concept at the 2009 Frankfurt auto show. Even with the smaller 1.8-liter Euro-spec engine, the Superlight weighed 2194 pounds, 114 more than this Speedster concept. Who’s superlight now?

REMOVING THE SOFTTOP
CUT ABOUT 25 POUNDS.



SPEEDSTER

plier Delta created a carbon-fiber version of its sporty, highly bolstered Mu-Len seat for the Speedster, dropping the MX-5’s already-low H-point another 1.5 inches. Mazda also relocated the push-button ignition to the center of the transmission tunnel, just behind the parking brake, amplifying the Speedster’s race-car vibes.

The Spyder’s interior retains more of its stock appearance than does the Speedster, except for a gorgeous application of ani-

**CUSTOM
8-BY-16-INCH
RAYS WHEELS
ARE WIDER
THAN STOCK
BUT AREN’T
ANY HEAVIER.**

line-dyed leather in a deep chestnut color. It wraps completely around the cockpit, covering the door panels as well as the center of the dashboard. The seats are dressed up in the material as well, with pale-orange inserts to match the abundant stitching. It’s striking and succeeds in elevating the inexpensive Miata’s presentation such that comparisons with Porsche’s Boxster Spyder won’t be limited to their shared nomenclature.

□ HARDWARE

Both cars sit 1.2 inches lower than stock, the Speedster by virtue of a K&W adjustable coil-over kit and the Spyder via non-adjustable springs. The exhaust plumbing is by Racing Beat. The aluminum muffler is lighter than the Miata’s and uses stock hangers, though Mazda designed specific center-exit exhaust tips for each of the concepts. The MX-5’s optional Club package donates its aero pieces and Brembo brakes. Wider aftermarket wheels and tires unique to each concept complete the modest performance upgrades.

□ PROSPECTS

Ken Saward, Mazda’s design manager for the concepts, is adamant that these cars are design studies. Since the fourth-gen MX-5 is still new, he says, Mazda didn’t want to change too much about the car. Though we caught him using the phrase “in production” during our interview, we don’t imagine there’s much chance of seeing a factory Speedster. Certainly the Spyder would make a more feasible production car. We’re holding out hope.



SINCE IT LACKS
A WINDSHIELD,
THE SPEEDSTER
HAS CUBBIES
FOR TWO
HELMETS
BEHIND THE
SEATS.



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By far, pickups and sports cars average the heartiest option bills. Here, a snapshot of the 20 highest average transaction prices relative to base MSRP by vehicle type:

PICKUP: 8
COUPE/
CONVERTIBLE: 6
CROSSOVER/
SUV: 3
SEDAN/
HATCHBACK: 3

Extra, Extra

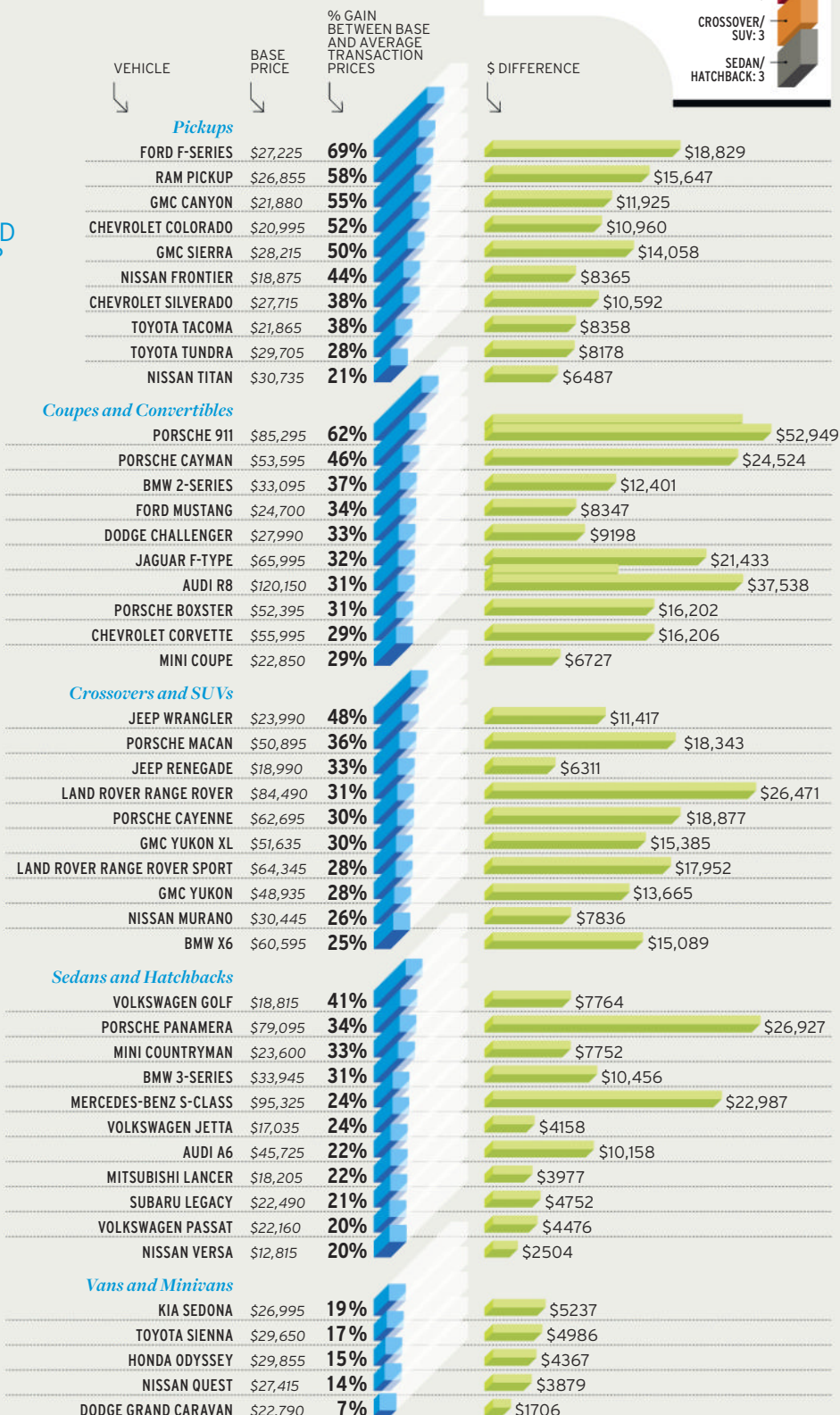
WHICH MODELS GET FITTED WITH THE MOST OPTIONS?

by Jared Gall

WHEN MERCEDES-BENZ BROUGHT OUT THE CLA compact sedan for 2014, the company made a lot of fuss about how buyers could now get a sparkly new Mercedes for less than \$30,000! (*Not including the destination and delivery charge, natch.)

But nobody was buying CLAs for even the \$30,825 that a base model really cost. Optional powertrains, trim packages, and other extras are a tractor beam moving transaction prices further and further from the advertised base price. Last year, the CLA left dealer lots at an average price of \$37,786. We got curious: Which other cars were also carrying big upcharges? With help from price-information clearinghouse TrueCar, we compiled a list of the car lines whose average transaction prices exceed their root car's base price by the greatest margins. Then, because the top of the list heavily favored specific vehicle types [see "For Work and Play," above right], we sorted the data by vehicle class. These are presumably the mainstream biz's biggest money makers:

TrueCar's data doesn't cover exotics and ultra-high-end cars, but you can bet that the price of the typical Ferrari or Rolls carries even more option inflation than anything listed here.



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upfront . THE PHYSICS OF ...

★ HOW THEY'RE MADE

GT350R wheelmaker Carbon Revolution starts with carbon-fiber tow (thousands of twisted strands) long enough to lap Earth twice. It places fiber preforms and woven fabric inside a mold with foam cores to fill the spokes, then injects resin, applies a vacuum, and cures the composite in a pressurized oven. Center, lug, and valve-stem holes are drilled, followed by a second cure and painting. Finally, Carbon Revolution fits anodized-aluminum center and lug-seat inserts.

1/10TH THE DIAMETER OF A HUMAN HAIR: THICKNESS OF EACH CARBON-FIBER STRAND.

CURB IMPACTS AND POTHOLE STRIKES CAN DESTROY STEEL WHEELS. WHILE EVEN A SMALL CRACK IN AN ALUMINUM WHEEL CAN GROW DURING CONTINUED USE, CARBON-FIBER WHEELS ARE NOT SUSCEPTIBLE TO FATIGUE FAILURE. MINOR SURFACE RASH CAN BE REPAIRED WITH STANDARD PAINTING METHODS.

\$3433 AND \$4053: REPLACEMENT COSTS FOR ONE FRONT AND ONE REAR SHELBY GT350R WHEEL.

Horse Shoes

QUANTIFYING THE BENEFITS OF THE SHELBY GT350R'S CARBON-FIBER WHEELS. *by Don Sherman*

AFTER FRED FLINTSTONE started us rolling, mankind advanced the cause of mobility with wheels made of wood, of spokes, and of metals. Now, thanks to the migration of composites from aerospace to motor-sports to the assembly line, Ford's Mustang Shelby GT350R is the first affordable car to fit carbon-fiber wheels as standard equipment.

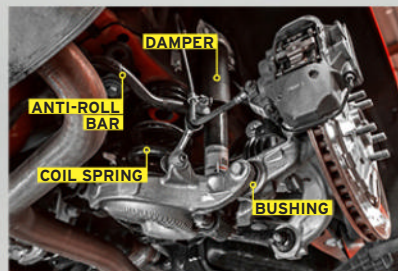
In doing so, Ford shaves 58 pounds from the GT350, even though the R's rubber and rims are wider. It's hard to imagine that the mass of a bag and a half of dog food would radically alter performance, but when we tested the identically powerful GT350 and GT350R, we noted a surprising difference in their acceleration times. Then we remembered that each wheel-and-tire assembly is effectively a flywheel that impedes acceleration and hampers braking.

So we set out to isolate just how significant that weight savings is. The GT350's aluminum wheels are wrapped in Michelin Pilot Super Sports, while the R's carbon-fiber rollers wear stickier Pilot Sport Cup 2s. To remove traction differences from the equation, we conducted only rolling-start acceleration tests. We tested the R both stock and with the additional rolling inertia of the GT350's heavier wheels and tires. Here's what we found:

TEST RESULTS

	ALUMINUM WHEELS	CARBON-FIBER WHEELS
WHEEL AND TIRE WEIGHT	F: 61 lb R: 61 lb	F: 46 lb R: 47 lb
ACCELERATION		
30-50 MPH, TOP GEAR	10.8 sec	9.9 sec
50-70 MPH, TOP GEAR	10.5 sec	9.7 sec
30-130 MPH, 4TH GEAR	17.7 sec	16.5 sec
COAST DOWN		
60-1 MPH*	139 sec 4944 feet	134 sec 4785 feet

*In neutral, to reveal differences in rotating inertia.



BUTTERFLY EFFECT

It's not just the GT350R's straight-line performance that benefits from lighter wheels. Because wheels are unsprung weight—supported by the road, not the suspension—their upward motion over bumps disturbs tire adhesion. The lighter the wheel, therefore, the better the motion control and grip. As a bonus, carbon fiber boasts a tensile strength 13 times that of aluminum.

The performance impact of wheels so much lighter and stronger ripples through the whole suspension system. Adam Wirth, Ford Performance chassis supervisor, reveals: "We installed firmer suspension bushings and larger anti-roll bars. Best results were achieved with significantly stiffer springs and additional damping in track mode. We also fine-tuned traction control, ABS, and stability controls. It was significantly more work than we expected, but we achieved major performance dividends, lighter steering effort, even a deeper tone in response to impacts."

wheel photograph by NATHAN GARCIA

SUSPENSION PHOTOGRAPH BY MICHAEL SIMARI

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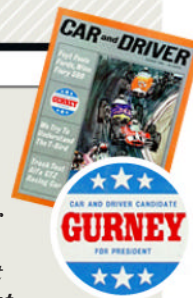
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upfront

TECH
DEPARTMENT

★ HISTORY LESSON

Then editor-in-chief David E. Davis Jr. launched the campaign to elect Dan Gurney president of the United States with his July 1964 column. While popular with our people, Gurney never appeared on any ballots. He was only 33 years old at the time, and thus ineligible to be president.



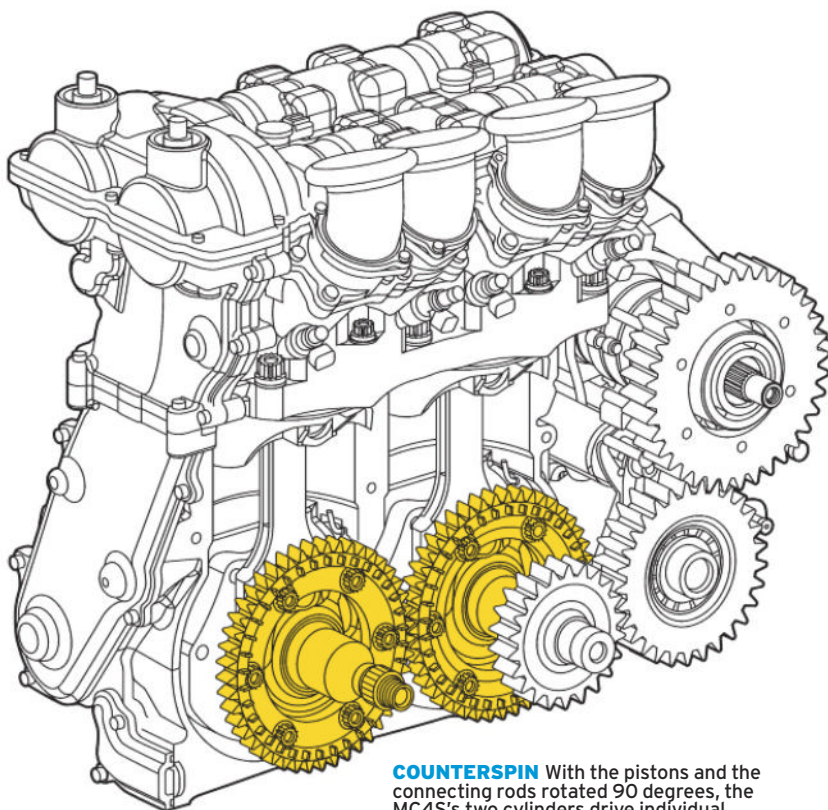
Gurney in 2016!

AMERICAN RACING GREAT DAN GURNEY IS STILL MAKING THE AUTOMOTIVE WORLD A BETTER PLACE. *by Eric Tingwall*

WHILE POLTROONS, charlatans, earnest amateurs, and fuzzy idealists vie for the presidency, in Southern California, Dan Gurney drafts proposals for a better internal-combustion engine. No, it's not 1964, and we're no longer stumping to send Mr. Gurney to Washington. But the 84-year-old nonpareil racer-cum-inventor refuses to retire. His latest work is the patented design of an internal-combustion engine intended for production vehicles.

Called the MC4S, for moment-canceling four-stroke, it's intended to be smoother and more reliable than the internal-combustion status quo. The design prioritizes durability, efficiency, and simplicity above power, and yet the engine still achieves the kind of performance you'd expect coming from a guy with 51 major racing victories. Gurney proposes that the MC4S engine could be used in everything from helicopters to cars; a motorcycle is the obvious first application, though.

The breakthrough feature is in the bottom of Gurney's two-cylinder, twin-crankshaft engine. Counterweights attached to the cranks cancel primary shaking forces as usual. Rotating the cranks in opposite directions eliminates the undesirable gyroscopic



COUNTERSPIN With the pistons and the connecting rods rotated 90 degrees, the MC4S's two cylinders drive individual crankshafts that rotate in opposite directions.

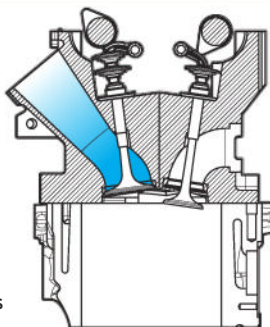
moment (rotating force) that occurs when the entire engine is rapidly rolled for cornering, hence the moment-canceling name. While this benefit is a boon to motorcycles, it doesn't apply to four-wheeled vehicles because their engines roll only a few degrees in corners.

The engine displaces 110 cubic inches, or 1800 cubic centimeters, with a broad 5.0-inch bore and a short 2.8-inch stroke. For the sake of durability, the average piston speed will be limited to 4200 feet per minute at 9000 rpm. Gurney also suggests that the patent could be adapted to four-, six-, and eight-cylinder designs.

Simulations predict the two-cylinder would make more than 250 horsepower, surprising Gurney's team. "We didn't think the numbers would be as large, but the same simulations have worked on our other engines within 2 percent," he says.

Gurney plans to build five prototypes, the first of which should be running on a test stand by July. If the engine lives up to its theoretical potential, Gurney hopes to license the design to a manufacturer. "We certainly have no idea how to produce anything at a reasonable price," he admits.

ANGLE IN THE DANGLE The counter-rotating crankshafts get the headlines, but the MC4S's impressive power is a product of its cylinder-head design. Gurney studied more than 200 valve-configuration variations to find the best arrangement. The intake ports taper to accelerate airflow, as is common in racing and high-performance engines. An optimum amount of squish—the inward movement of the air-fuel mixture toward the center of the chamber as the piston approaches top-dead-center—improves combustion. Cam phasers tweak the timing of valve events to balance low-end pull with top-end vigor. Computer simulation suggests that the idealized cylinder head leads to a 15-percent increase in the amount of airflow versus a conventional head. With that design, the engine should be good for 262 horsepower. The simulation predicts an output of 189 horsepower with a conventional head.





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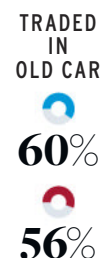
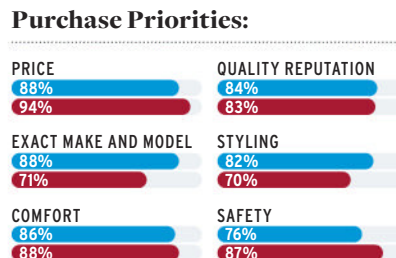
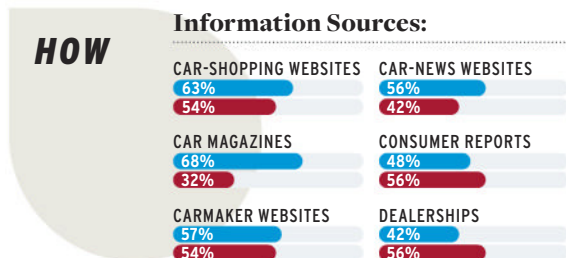
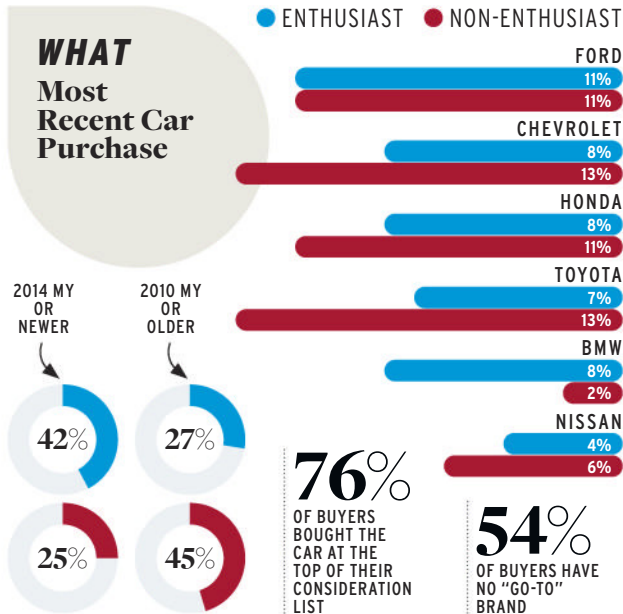
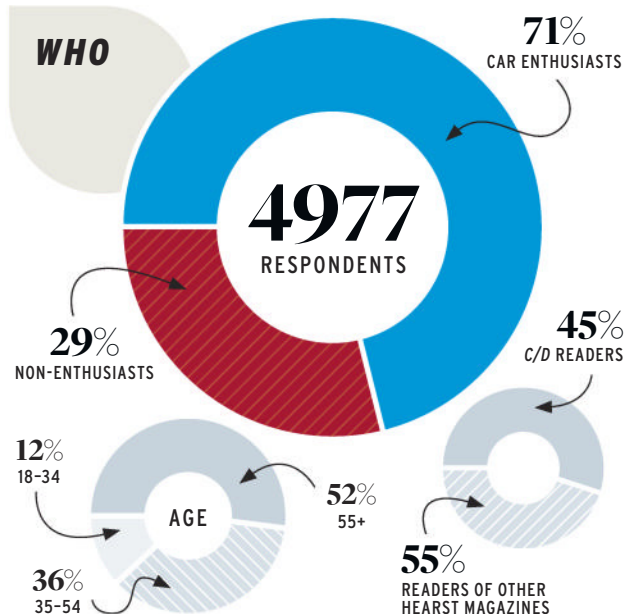
THE FIFTH IN OUR FIVE-PART SERIES ON CAR COMMERCE SAYS:
ENTHUSIASTS SHOP DIFFERENTLY. *by Jeff Sabatini*

LAWYERS NEVER ASK QUESTIONS without knowing the answers. We as journalists subscribe to the opposite view, but conducting a reader survey falls in between. With this one, we sought to tease out some numbers regarding car buying. Here's one: 80 percent of respondents were "very satisfied" or "extremely satisfied" with their dealership experience. If that contradicts conventional wisdom, it does explain why 68 percent of respondents would not buy or lease a vehicle without visiting a dealership and 84 percent would not buy or lease without a test drive. Indeed, if the bricks-and-mortar dealership system is going to be overthrown, our survey indicates that Silicon Valley might ally with car enthusiasts. While only 34 percent of non-enthusiasts said they would purchase a car over the internet, 54 percent of enthusiasts would be inclined to do so. We've highlighted more of these "significant statistical differences" (as our research department calls them) between enthusiasts and non-enthusiasts in the accompanying graphics.

THE DIGITAL GENERATION is expected to impact every aspect of the car business, but it's a process that still seems nascent. Predictably, our survey shows that car buyers aged 18 to 34 are more likely to have recently purchased their first car than other age groups and are more likely to buy used. And young buyers are more inclined to go shopping in search of a safer car or because of a lifestyle change. Which is what kids have been doing forever—replacing a junker shortly after landing a decent-paying job.

Younger men are more likely than others to sell their old car online, probably a byproduct of more young buyers being dissatisfied with trade-in offers than other age groups. Despite the stereotype of youthful impatience, men aged 18 to 34 are more likely than others to take more than a year researching their purchase. And yet, younger buyers are more likely than older ones to make taking delivery of a new car their only trip to a dealer.

It follows that young people are the most likely to use mobile devices for research, prioritizing up-to-date dealer inventories and vehicle-history reports. But younger buyers are also more interested in test drives than other age groups. Indeed, younger buyers can be shockingly conventional. When asked if they would purchase a new car over the internet, 56 percent were disinclined to do so, matching the number of respondents over 55 who reject what is expected to someday be the Holy Grail of car commerce.



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Let's
Go
Places

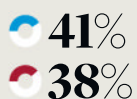
Prototype shown with options. Production model may vary. 1. 2016 EPA-estimated 34 city/33 combined mpg for RAV4 Hybrid. AWD-i models only. Actual mileage will vary. 2. When compared to 2016 RAV4 gas models. ©2015 Toyota Motor Sales, U.S.A., Inc.

● ENTHUSIAST
● NON-ENTHUSIAST

WHERE

REASON FOR CHOOSING DEALERSHIP:

PROXIMITY



MODEL AVAILABILITY

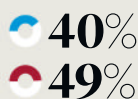


PRICE

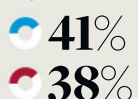


NUMBER OF DEALERS VISITED:

1



2-3

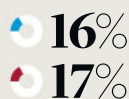


4+



NUMBER OF TEST DRIVES:

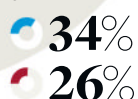
NONE



1-2

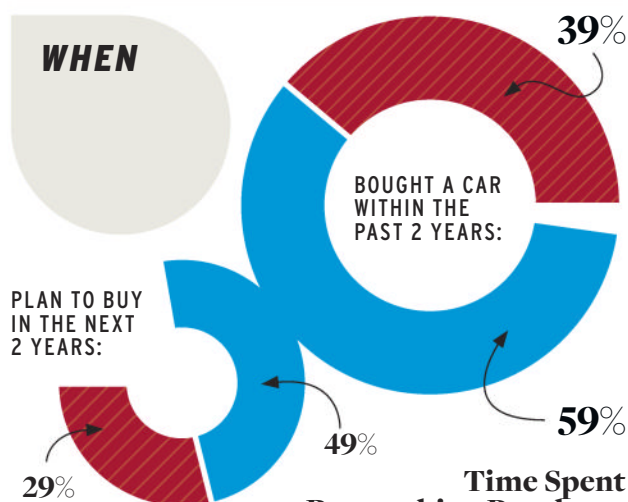


3+

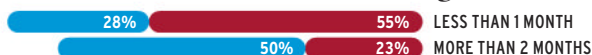


FAIR DEAL? — Buying a new car usually means trading in an old one. When asked if they were satisfied with the dealer's offer, 81 percent of enthusiasts said "Yes" compared with only 74 percent of non-enthusiasts. Only 9 percent of enthusiasts were unsure, while 19 percent of non-enthusiasts said they didn't know if the price was fair.

WHEN



Time Spent Researching Purchase:

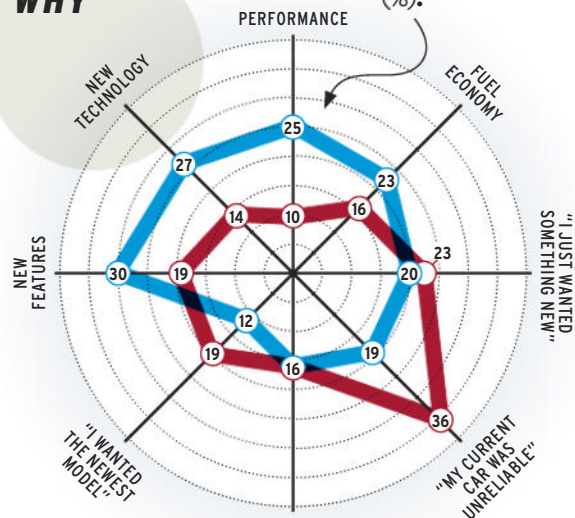


Time Spent Shopping:

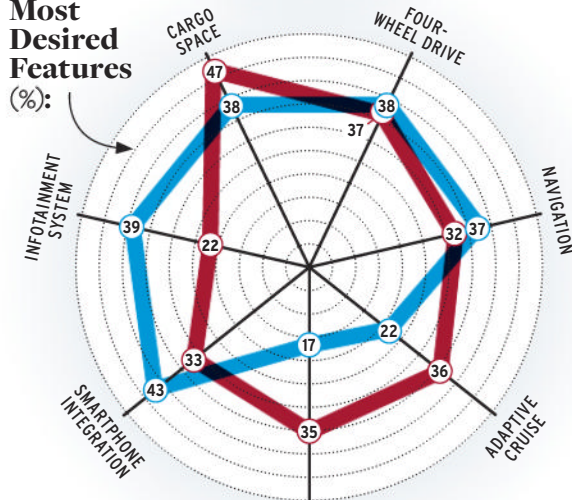


WHY

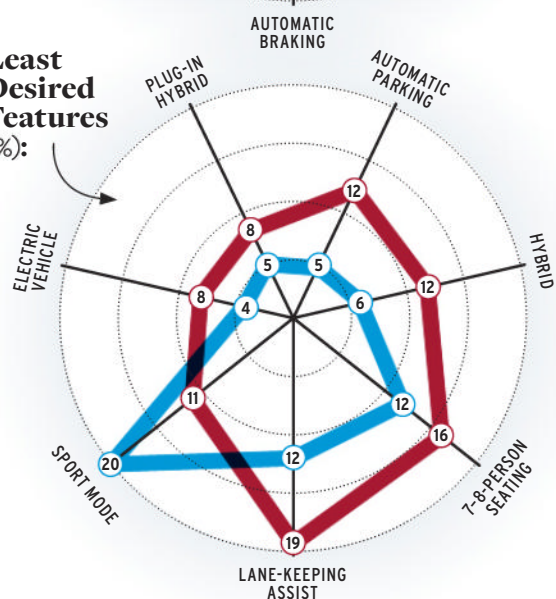
Motivations to Shop for a New Vehicle (%):



Most Desired Features (%):



Least Desired Features (%):





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by John Phillips

THEATER OF THE MIND.



When I was in high school, each zit-bedazzled student underwent a mandatory one-on-one with the guidance counselor, who was bald and terrifying in the way Nikita Khrushchev was bald and terrifying. The counselor asked if I had pondered a career. “Race-car mechanic or drummer for Herb Alpert & the Tijuana Brass,” I responded, which caused him to rap his pencil on the desk, as if trying to break both. “Guess I’ll be calling your parents,” he replied. But when he reached my mother, she belted out a shopping list of reasons why guidance counselors should hang themselves from lampposts. The matter of my career arose never again.

So I smiled to learn that Michael Paul Smith’s high-school guidance counselor was little better, telling him he had “no apparent creative talent that could be used for employment. Go work in the steel mills.”

Smith, now 65, declined. Instead, he designed displays for the Smithsonian, became an architectural model maker, a textbook illustrator, and the art director for an ad agency. The agency’s crushing deadlines induced a heart attack, so, for the last 17 years, Mr. Smith has been working in his kitchen.

X-Acto blade in hand, he’s been assembling 1/24th-scale dioramas—’50s and ’60s houses, garages, warehouses, lawn furniture, and billboards. Into those scenes he inserts any of 300 die-cast automobile models he owns, most from the Franklin and Danbury mints. He positions his detailed miniatures on a flat foam-core base—painted to look like asphalt, oil stains and all—then schleps the scene around his Boston environs until he finds a complementary real-life background. Wielding a point-and-shoot Canon PowerShot SX280 whose varied functions reliably confuse him, he then photographs the two scenes—fake foreground, real background—until he obtains a single image so persuasively conjoined as to cause first-time viewers to remark, “That’s impossible.” A willing suspension of disbelief is not required. The trickery lurks in the illusory residue of forced perspective, via Smith’s extraterrestrial ability to correlate conflicting depths of field. “My two big



► Is this real? In Michael Paul Smith’s world it is.

rules are to keep everything in scale,” he says, “from the thickness of the shingles to the doorknobs. And to shoot at what would be eye level for a person walking through the scene.” A person four inches tall.

Smith’s images have just been published in a coffee-table book, *Elgin Park: Visual Memories of Midcentury America at 1/24th Scale* (Animal Media Group, \$75). It’s a car enthusiast’s time machine, especially for baby boomers. Smith’s devotion to period-correct details may border on the religious. Take, for example, his hand-

built bungalow house, with a ’41 Chevrolet parked alongside. It took four months to distill that diorama into a single persuasive image. “If I included my labor at \$15 an hour,” he says, “it probably represents \$35,000 to \$40,000.” He often paints his cars’ whitewalls black “because whitewalls, back in the day, cost \$5 extra, so you didn’t see that many.”

Creating the image that Smith sees in his brain may require 100 photos taken over three days, during which he must fret about windstorms that occasionally dash the whole diorama. “It sure has ruined a few cars, and they don’t bend realistically,” he laments. He works in silence—no radio, and no TV because he doesn’t own a TV. He’s been followed by police helicopters monitoring his admittedly odd movements. Even though he received permission from a local homeowner whose residence he wanted to meld with a 1936 Packard V-12 Phaeton, the owner became unhinged just as Smith began photographing. That time, he managed only three photos before Five-O rolled up. Yet the finished product is among the most compelling in the book.

“Other than talking to policemen, I’ve become something of a recluse,” he told me. “I spend my waking hours in my third-floor apartment’s kitchen. I was the nerd in high school. I’m still that guy. My early models were all flawed, so I ran over them with a lawn mower. The rest I set on fire with modeling glue.”

Although Smith once owned a ’51 Studebaker Champion sedan, he now possesses no real-life car. His enthusiasm is confined to automotive styling, which explains his favorite models: “A ’63 Corvette that’s actually made from fiberglass,” he beams, “and a ’57 Mercury Turnpike Cruiser that makes me smile every time I see it.”

He places no 1/24th-scale people in his dioramas, although you won’t notice until it’s pointed out. “One of my neuroses is that a person in a photo distracts me because I want to know his story,” he explains. Film companies and ad agencies for luxury cars have come calling, but Smith has so far said no. “It would take months to do what they’re asking. I told them, ‘It’s only me at my kitchen table, and assembling just one building takes forever.’ They wanted 150 buildings.”

America probably doesn’t need more proof that perception often happily trumps reality. But here it is, artfully rendered. Our presidential candidates should take note. ■

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by Aaron Robinson

MAZDA SWINGS BY SOME LUCKY THREADS.



One week before an orthopedic surgeon tunneled into my spine, my wife and I packed our two small parrots into a Mazda CX-3 for a trip to the Bay Area, where I was to drive the new Acura NSX. Of course, the NSX was memorable, as was a bungled attempt to sneak our squawking luggage into the St. Regis San Francisco. But the CX-3 also impressed. Say what you will about the scourge of cute utes, this car is no brain-dead appliance. It shines in every respect, from the canny space utilization to the deft handling to the thrifty fuel economy, which averaged 30 mpg despite my usual pounding pace. One interested party that has often delivered a boisterous opinion on test cars, my severely herniated L5-S1 disc (part of which is now landfill), even murmured quiet approval.

Mazda is an anomaly in a number of ways, starting with the fact that it is both independent and tiny. The automaker—based in balmy, tree-lined Hiroshima where the savory pancakes called *okonomiyaki* get cooked to a particularly yummy local style—built just a little over 1.3 million vehicles in 2014. That makes Mazda less than half the size of Suzuki. Only Subaru and Isuzu are smaller among Japan's automakers, though Subaru is gaining rapidly and outsells Mazda two to one in the U.S.

Mazda is also unusual in having confidence in what it stands for. Over the years, and especially since the recession, we've watched many a proud brand sink into deep second-guessing about identity. Toyota was always the staid quality company; Toyota 2.0 wants to be exciting even if it means being gruesome. BMW went mainstream for volume and launched a major diversion into eco-vehicles. Mercedes and its rivals are racing each other to fill every conceivable micro-segment, diluting their brands through product overload.

Meanwhile, Mazda's two new products last year, the Miata and the CX-3, show the company's clarity of purpose. The four-door Miata, smaller and lighter against the industry norms, is a flagship embodying the brand's core selling point of cheap fun. The CX-3 carries it into a more practical segment, and I have no doubt that the new



► Mazda showed us a rotary Vette; let's see a rotary 4C.

big CX-9 will, too. In an industry increasingly obsessed with dashboard apps and automated cars, Mazda has planted its flag and it says, "Drivers, we are for you."

The only problem is that the clock is ticking on Mazda's moment. To help stave off bankruptcy in 2008, Ford shed most of its stake in Mazda as part of a fire sale of assets, cutting the company loose to sink or swim on its own. Ford may have meddled, but it gave Mazda global scale and enormous purchasing power. With Ford's shadow gone, the hot sun of industry eco-

nomics now beats down. Little Mazda must prove Fiat Chrysler chairman Sergio Marchionne wrong when he insists that only giants will survive in the future.

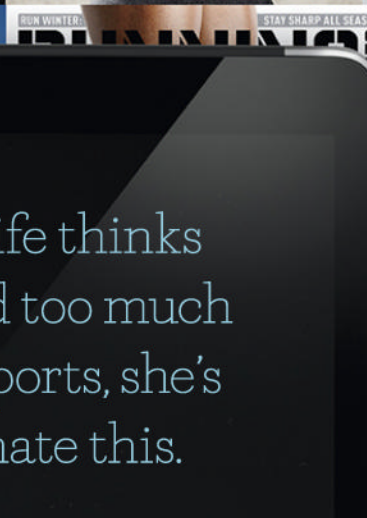
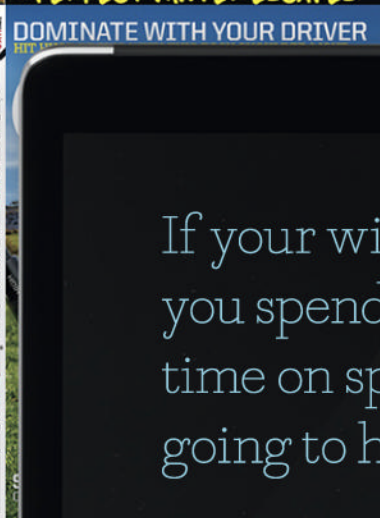
So far, the company has been both shrewd and lucky. It emerged from the Ford breakup and the recession fired up and focused on its enthusiast mission, brandishing the current Kodo design language and Skyactiv engineering as potent weapons. Today's cars are uniformly excellent, even if their small marketing budgets mean they struggle to get on shopping lists. Strategic tie-ups, including the Mazda MX-5 Miata/Fiat 124 Spider and the Mazda 2/Scion iA deals, help keep the plants busy, and nimble production methods, including a switch to CNC machining of engine blocks instead of station-to-station machining, give Mazda greater line flexibility while cutting tooling costs.

To the lucky part: Currency shifts greatly affect profits, and no Japanese automaker is more exposed than Mazda, which still keeps about 63 percent of its production in Japan even as other automakers have largely moved offshore. But, so far, the persistently weak yen helps make Mazdas affordable. Mazda also may gain from the Trans-Pacific Partnership (TPP), the massive trade deal that could drop tariffs and make it easier to both build cars in Japan and sell them overseas, especially in developing markets. And Mazda may yet be spared from the risk of introducing diesels to the U.S. now that Volkswagen has dynamited diesel's reputation.

However, Mazda's moment can pass quickly. Exchange rates fluctuate, and the TPP cuts both ways, putting Mazda in competition with tariff-free vehicles exported from North America's teeming transplant factories. Diesel may be dying, but it's being replaced by electrification, no small challenge for Mazda, which licenses Toyota hybrid tech but doesn't currently market any gas-electrics in the U.S.

And, as my coworker and longtime Mazda owner Don Sherman says, the Zoom-Zoom company "needs the second Zoom."

It's got the Miata, and in Tokyo in October it showed a sort of concept rotary Chevy Corvette. Neat, but an Alfa Romeo 4C by a company that takes quality seriously could finally give Porsche's Boxster/Cayman its first real competition. Acura way overshot with the mega-expensive NSX, so our hopes are now pinned on Mazda, a company that seems to know exactly what our kind wants. ■



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by Ezra Dyer

WELL, YOU CAN'T PLEASE EVERYONE.



I just finished reading Richard Porter's *And on That Bombshell: Inside the Madness and Genius of Top Gear*. It's an entertaining book, partly because *Top Gear* existed in its own vortex of ridiculous situations, and partly because Porter is the source of much of the absurd humor that informed the show. But the BBC series is finished, so Porter is now free to reveal some of the behind-the-scenes stresses that were inevitable on a production of that size. One challenge was keeping track of which car companies they had pissed off, so the production staff created a chart called "Loves Us/Hates Us." It's hard to relate to much of *Top Gear*—the logistics of building a rocket-powered Mini are beyond my ken—but this is a dynamic with which I am all too familiar. And Porter's book

got me thinking about what my own Love/Hate chart would look like.

The unfortunate truth is that there's only one road to Love, but Hate is a four-lane highway with an on-ramp every hundred yards. If a car company loves you, it's because they have a great car, you affirmed that it's great, and then you returned it with its greatness intact. Remove any of its three legs and this stool falls over. Spoiler alert! That's what a certain photo crew should've told me before they returned a Nissan GT-R NISMO with a broken front splitter. Excuse me while I put on my bathing suit and jump in the hate tub.

Also tuning in for a rock block of Dyer Hate is Lamborghini. Lambo has a fairly precise idea of what its cars are about: sexy, exclusive, exotic. So when you demonstrate that an Aventador Superveloce can be used as a leaf blower—its quad exhaust pipes are conveniently angled toward the ground—you might get an irate phone call explaining that this helpful consumer advice was not well received in Sant'Agata.

I was probably not their favorite fellow even before that, on account of an incident with a Gallardo and a New York City school bus. I wasn't driving, but I'd secured the car for a TV production. So it was my name on the paperwork when the bus turned left and its rear bumper swung right—right into the flank of the Gallardo. A steel bumper raking the side of a Lamborghini is the sound of God's nails on the chalkboard, I tell you. Back at the dealership, I handed over the keys with an extra helping of apologies, but the guy there was cool. "This happens all the time," he said. "Trucks can't see these cars in the city. You've seen what happened to the one we loaned to Russell Brand?" I replied that I thought Brand didn't have a driver's license and the dealer agreed that he didn't. Like me, Brand apparently did his damage from the passenger's seat.

So while I love Lamborghinis, my feelings go unrequited. But I'd bet a bottle of Barolo that I'll take a Urus across the Rubicon before I drive a Maserati. I last drove a Maserati in

2000, for a half-hour. I came close about five years ago, when I was slated to review a GranTurismo in Italy. But a couple days before I flew in, I got an email that the car was, er, no longer available. Maserati ended up renting me an Alfa Romeo Giulia from Avis, and I reviewed that instead.

Maseratis you can live without, but it would be a real shame to have Porsche fly away in a hate-air balloon. I think Porsche hates me, but it might be more likely I'm suffering delusions of grandeur to assume that Porsche even cares.

My relationship with Porsche reminds me of an incident long ago when I was part of an editorial email chain soliciting a list of cool cars. The late David E. Davis Jr. was part of that reply-to-all, and his selections seemed calculated to demonstrate that he knew more about cars than anyone else—his cars were not only cool but completely obscure. So, in a fit of questionable judgment, I decided to lampoon David E.'s list with a facetious roster of imaginary machines, like the 1917 Frigg-Wocker Pert Roustabout with Stromboli body and optional servant's quarters. Oh, you haven't heard of that? You must not know much about cars, I guess.

As soon as I hit "send," I regretted it. What kind of idiot mocks David E. Davis Jr.'s list of cool cars? We're talking about a guy who'd fire someone for wearing the wrong shirt. I was a freelancer, so I guess, technically, he couldn't fire me, but I still imagined he might show up in my driveway with a Range Rover and a shotgun. About five minutes after I sent the email, I expressed my regret and misgivings to another editor, who replied: "Don't worry. He has no idea who you are." This turned out to be correct.

I think that's where I'm at with Porsche. I may as well fret over what Kate Upton thinks of me. Rolls, on the other hand: I'm sorry about the chicken in the Ghost. BMW: I know you'd rather I hadn't dyno'd that suspiciously strong M6. Lotus? Come on, I was just being honest.

Fortunately, time has a way of thawing icy impassés. Even Maserati could be coming around. About a year ago they sent me a bottle of balsamic vinegar from Modena. That might've been my signal to leave the hate highway and find the road to amends. But I think I missed my exit. ■



► The Aventador SV, just looking cool and not doing anything silly.



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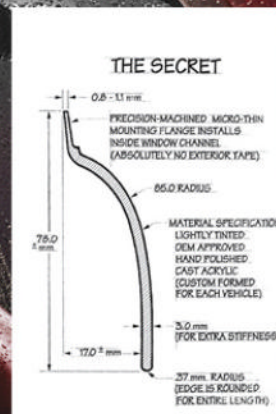
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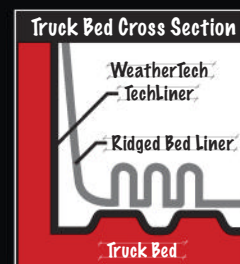
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0-60 MPH > 4.3 sec



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BY DANIEL PUND / PHOTOGRAPHY BY GREG PAJO

A blue Chevrolet Corvette Stingray Z51 is shown from a front-three-quarter perspective, driving on a paved road that curves through a mountainous landscape. The car is in motion, with motion blur on the wheels and the background. The driver is visible through the windshield. The scene is set during sunset or sunrise, with warm, golden light illuminating the mountains and the car's body. The car's headlights are on, and the Chevrolet bowtie logo is visible on the front grille.

CHEVROLET
CORVETTE
STINGRAY Z51

PRICE > \$70,830
POWER > 460 hp
TORQUE > 465 lb-ft
WEIGHT > 3452 lb
0-60 MPH > 3.9 sec



Chairman Mao Zedong, a fan of the red but not so much of the white or the blue, once said, “I got more hoes than the ozone.” Oh wait, it might have been Abraham Lincoln who said that.

The quote we were Google-searching for from Chairman Mao was something about asymmetric warfare, about how a fighter must move amongst the people as a fish swims in the sea, which is way more poetic and stuff. And what we have here is a classic asymmetric fight; a battle in which one side is conventionally powerful and established and the other is a fish.

All of this brings us inextricably to the showdown that neither Chevrolet nor Ford probably had in mind: the one between the

Corvette and the new Shelby GT350. We set out to find the best American sports car that a successful, but not necessarily rich, person could attain. We would want road-course competence from our winner, but not at the expense of real-world drivability, since it is sadly the real world in which we spend most of our time. Our winner should look fast, sound fast, and be fast. But most important, it should be thrilling to drive.

Playing the role of the established powerhouse is the seventh-generation Corvette. We chose an example with the Z51 performance package to bring the track prowess we were looking for. And because driver engagement and enjoyment are paramount in this test, we chose the seven-speed manual transmission. Chevy provided just such a car, loaded up with the 2LT package of niceties (\$4455), Magnetic Ride

Control shocks (\$1795), the data-and-video system for recording laps (\$1795), the vibrant but extra-cost Laguna Blue paint (\$995), and “sueded microfiber” seat inserts (\$395). This ballooned the Z51’s suggested price from \$61,395 to a whopping \$70,830. But if you were to spec out a more basic performance Z51, you could easily cut \$7000 from what this car cost.

Our insurgent, the Shelby GT350, is a car that would easily swim through the sea of EcoBoost and GT Mustangs undetected, were it not for its ripping exhaust note. Mustangs were never really intended to battle Corvettes. Hell, they have at various times shared platforms with Falcons, Pintos, and Fairmonts. But this one—this frankly shockingly special version—can put up a legitimate fight even though it’s more than 300 pounds heavier and is more





than five inches taller than the Corvette. We specified a regular GT350 with the optional Track package instead of the R version because we wanted as much on-road sophistication as possible, and also because we wanted tires that roughly match the stickiness and longevity of the Corvette's. The Track package—which brings magnetic shocks, a front strut-tower brace, firmer springs, and oil coolers for the engine, transmission, and differential—rings in at a not-insubstantial \$6500. The only other option on our test car was the \$475 “Over-the-Top Racing Stripes.” Unfortunately, once you opt for the Track package, Ford locks out the navigation system, upgraded stereo, and a few other goodies available to standard GT350 buyers.

All in, our GT350 cost \$56,970. That's a substantial discount from our Corvette. The Chevy makes back all the points it loses for its inflated sticker in our features and amenities category—and then some. After all, this is supposed to be an asymmetrical fight.

We bombed around Willow Springs International Raceway in Southern California, gleefully roasting Michelins. We strapped on our instruments for our normal battery of proving-grounds tests. And we assaulted some of the country's finest roads between our high-desert test facilities and the clogged thoroughfares of Los Angeles. In the final accounting, it was the insurgent that wound up with more hoes.

2. CHEVROLET CORVETTE STINGRAY Z51

With a thoroughbred bloodline and a track-focused setup, this Z51 clobbered the Big Willow road course. Senior editor and chief lap-per Tony Quiroga said with uncommon enthusiasm, “That car is

THE CARAMEL-HUED SEATS LOOK MORE DELICIOUS THAN THEY FEEL. THE VETTE'S BIG, LOW-REVVING ENGINE AND TALL GEARING MAKE FOR RELAXED TOURING.



really good out there.” Indeed, the Corvette, with an inch lower center of gravity, a slight rearward weight bias, and huge grip from sticky Michelin Pilot Super Sport tires, felt perfectly at home on Willow's high-speed constant-radius turns. It shouldn't be a surprise: The Corvette's front tires chatter in low-speed, high-steering-lock situations, such as parking maneuvers, as if to say, “Hey, I'm aligned for the track. Will you speed up already?”

The big-displacement and relatively lazy-revving 6.2-liter pushrod V-8 provides plenty of thrust across its rev range. No need to zing the engine; it'll pull plenty hard below the tachometer's Mason-Dixon line. Making laps even easier are the automatic rev-matched downshifts, which we grew to appreciate. A fine performance, then, and a quicker lap than the GT350 by 1.3 seconds over Big Willow's 2.5-mile length, all accompanied by a deep-throated roar.

The Z51's proving-grounds performance was likewise impressive at less than four seconds to 60 mph, less than 150 feet braking from 70 mph, and more than 1.0 g of grip on the skidpad. Those figures were supercar feats not so many years ago.

Probably, our road drive was where the feature-laden Corvette began losing this comparison test. The Corvette is no track-day special, despite its excellent track-day performance. It doesn't ride like a buckboard, and the thick torque delivery and supertall seventh gear provide quiet, relatively fuel-efficient, and relaxed touring.

But the Corvette is a little too relaxed and easy for our back-road desires. What works on the track doesn't always work on



CHEVROLET CORVETTE Z51

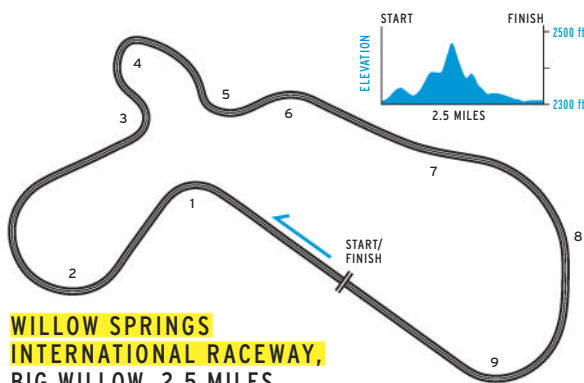
+ QUICKER THAN THE GT350, AN EXCELLENT TRACK CAR, EASY POWER.
■ LIFELESS STEERING, RESISTANT AND SOMETIMES WAYWARD SHIFTER.
■ GENERATES BETTER NUMBERS THAN THE GT350 BUT WITH LESS ENJOYMENT.

the road. The Corvette's steering is a disappointment, remaining relatively inert regardless of how much lateral load the front tires are experiencing.

It's a disconnect that saps driver confidence in the machine. If we weren't driving the Corvette back-to-back with the GT350, we might not be so hard on its steering system. But it should be better than it is.

Then there's the shifter, which feels resistant in action, as if it's bound up. There's no positive sense of mechanical engagement. Worse, it's easy to grab the wrong gear. "Oh, damn. Why is there no power? Oh, right, I'm in seventh, not fifth," the buzz-killed driver will say. Sure, it has seven gears to accommodate in a relatively small space, but then so does a Porsche 911's manual and we've never had a problem finding the correct gear at the correct time in that box. The Corvette's seats, though a great improvement on the C6's floppy buckets, are not as supportive or comfortable as the GT350's Recaros.

The Corvette, even in Z51 guise, still has to satisfy a pretty broad selection of potential buyers—the more leisurely of whom might squawk about restrictive seats or busy steering. But the result is a vehicle that, despite its excellent performance, simply doesn't feel that special, and one that is ultimately just not as fun to throw around.



WILLOW SPRINGS INTERNATIONAL RACEWAY, BIG WILLOW, 2.5 MILES

LAP TIME (MIN:SEC)/AVERAGE SPEED

CHEVROLET CORVETTE STINGRAY Z51, 1:33.2/96.6 MPH

It shouldn't come as a surprise that the harder-accelerating, grippier car was the faster of the two at the track. And so it goes. The Vette's stunning front grip allowed us to enter turns 1 and 8 with more speed and resulted in a higher peak speed of 143 mph on the front straight.

FORD MUSTANG SHELBY GT350, 1:34.5/95.2 MPH

No less fun than the Corvette, the GT350 could muster a peak speed of only 140 mph. Despite its wider tires, the GT350 simply doesn't develop the grip of the Corvette (although the Chevy's tires showed much more wear after a day of lapping). The only place the GT350 was quicker was in Turn 3 because it's easier to put its power down. It was a good day.

VEHICLE	CHEVROLET CORVETTE STINGRAY Z51	FORD MUSTANG SHELBY GT350
BASE PRICE	\$61,395	\$49,995
PRICE AS TESTED	\$70,830	\$56,970
DIMENSIONS		
LENGTH	176.9 inches	188.9 inches
WIDTH	73.9 inches	75.9 inches
HEIGHT	48.6 inches	54.2 inches
WHEELBASE	106.7 inches	107.1 inches
FRONT TRACK	63.0 inches	63.3 inches
REAR TRACK	61.7 inches	63.7 inches
INTERIOR VOLUME	F: 52 cubic feet	F: 55 cubic feet R: 30 cubic feet
CARGO VOLUME	15 cubic feet	14 cubic feet
POWERTRAIN		
ENGINE	pushrod 16-valve V-8 376 cu in (6162 cc)	DOHC 32-valve V-8 315 cu in (5163 cc)
POWER HP @ RPM	460 @ 6000	526 @ 7500
TORQUE LB-FT @ RPM	465 @ 4600	429 @ 4750
REDLINE/FUEL CUTOFF	6500/6600 rpm	8250/8250 rpm
LB PER HP	7.5	7.2
DRIVELINE		
TRANSMISSION	7-speed manual rear	6-speed manual rear
DRIVEN WHEELS		
GEAR RATIO:1/MPH PER 1000 RPM/MAX MPH	1 2.97/7.6/50 2 2.07/10.9/71 3 1.43/15.8/103 4 1.00/22.6/147 5 0.71/31.8/181 6 0.57/39.6/175 7 0.48/47.0/170	1 3.25/6.5/54 2 2.23/9.5/79 3 1.61/13.2/109 4 1.24/17.1/141 5 1.00/21.2/175 6 0.63/33.7/165
AXLE RATIO:1	3.42, limited slip	3.73, limited slip
CHASSIS		
SUSPENSION	F: control arms, leaf spring, anti-roll bar R: control arms, toe-control link, leaf spring, anti-roll bar	F: struts, coil springs, anti-roll bar R: multilink, coil springs, anti-roll bar
BRAKES	F: 12.6-inch vented, grooved disc R: 13.3-inch vented, grooved disc	F: 15.5-inch vented, cross-drilled disc R: 15.0-inch vented, cross-drilled disc
STABILITY CONTROL	fully defeatable, traction off, competition mode, launch control	fully defeatable, traction off, competition mode, launch control
TIRES	Michelin Pilot Super Sport ZP F: P245/35ZR-19 (89Y) R: P285/30ZR-20 (95Y)	Michelin Pilot Super Sport F: 295/35ZR-19 (100Y) R: 305/35ZR-19 (102Y)

C/D TEST RESULTS

ACCELERATION		
0-30 MPH	1.8 sec	2.0 sec
0-60 MPH	3.9 sec	4.3 sec
0-100 MPH	8.7 sec	8.9 sec
0-150 MPH	22.1 sec	22.1 sec
1/4-MILE @ MPH	12.2 sec @ 119	12.5 sec @ 119
ROLLING START, 5-60 MPH	4.4 sec	4.7 sec
TOP GEAR, 30-50 MPH	12.6 sec	10.9 sec
TOP GEAR, 50-70 MPH	11.5 sec	11.3 sec
TOP SPEED	181 mph (drag ltd)	175 mph (redline ltd, C/D est)
CHASSIS		
BRAKING, 70-0 MPH	149 feet	171 feet
ROADHOLDING, 300-FT-DIA SKIDPAD	1.05 g	1.00 g
WEIGHT		
CURB	3452 pounds	3790 pounds
%FRONT/%REAR	49.2/50.8	53.2/46.8
CG HEIGHT	18.0 in	19.0 in
FUEL		
TANK	18.5 gallons	16.0 gallons
RATING	91 octane	91 octane
EPA CITY/HWY	17/29 mpg	14/21 mpg
C/D 200-MILE TRIP	16 mpg	14 mpg
SOUND LEVEL		
IDLE	52 dBA	54 dBA
FULL THROTTLE	89 dBA	90 dBA
70-MPH CRUISE	71 dBA	73 dBA

tested in California City, California, by TONY QUIROGA



1. FORD MUSTANG SHELBY GT350

Our always-succinct Quiroga summed up the Shelby GT350 thusly: “If Porsche’s GT team built a Mustang, it would be the GT350.” There’s not nearly as much hyperbole in that statement as might first appear.

There’s surely some freedom in developing a performance car that need only sell in the thousands, instead of the tens of thousands. You needn’t worry about the poseurs. The lack of an available automatic transmission should keep many of them away. The blaring exhaust note and vibration from the 5.2-liter flat-plane-crank V-8 will frighten off the others. Also, let’s stop to consider that the company undertook a significant engine program for the sake of this one vehicle. You couldn’t drop this thing into an Explorer to amortize its development costs. It might have started as a Coyote 5.0-liter, but it is essentially nothing like the Five-Oh in character or specification.

And it is glorious. True, it doesn’t really come alive and pull in earnest until 4000 rpm. But even then, it’s barely halfway through the tachometer. Its 526 horsepower arrives at 7500 rpm, and by the time you get there, you’re also at peak titillation—your nerve endings buzzing in concert with the engine’s zing. It’s not a pretty-sounding thing. Instead, its blare is of a machine that seems to care only about the beauty of power. Its creators think burbling exhaust notes are, at best, cute.

Owing to its crankshaft design and lack of balance shafts, this is not the smoothest V-8. It is, in fact, one of the least smooth. Shoot through to the far side of the tach and the engine sends a mighty vibration through the pedals and the dash and your seat bottom. Perhaps this is why Quiroga described the GT350 as a “Sybian.” We wouldn’t know. But we do know that, in this case, the



vibration is exhilarating, even if the instrument-panel pieces might not like it in the long run.

Ford Performance swapped out the GT’s six-speed Getrag manual transmission for this Tremec six-speed that is lighter and better shifting. It can be rushed into its gates with minimal friction and maximum mechanical feel, keeping the engine fully on the boil and making the thing feel like, well, a GT-edition Porsche. Curiously, the shifter itself does not vibrate in sympathy with the engine.

The GT350’s pedals are a study in performance-car effectiveness. The clutch pedal is light in action—an unexpected boon for commuting in traffic—and the take-up allows for smooth, quick shifting. The brake pedal is firm and progressive, significantly better than the Corvette’s. One note about the GT350’s braking performance: Don’t do a day of lapping the day before you go to the proving grounds. That’s a roundabout way of saying that the GT350’s 171-foot braking distance is not representative of what a GT350 can do. An earlier GT350 of the same spec did the deed in 152 feet. So, yeah, we think our track day might have glazed the pads a bit. Oops. There’s no real need for an automated rev-matching system in the GT350, which is good because it doesn’t have one. It’s easy enough to heel-toe, and the free-revving engine is blip-tastic.

There’s no shame in the GT350’s

WE DIG THAT FORD DIDN’T TRY TO PRETTY-UP THE ENGINE WITH A PLASTIC COVER. STEERING, BRAKES, SEATS, SHIFTER, AND ENGINE: FORD GOT ‘EM ALL RIGHT.



★ FINAL RESULTS

RANK

1

2

Chevrolet Corvette Z51
Ford Shelby GT350
Maximum points available

VEHICLE

DRIVER COMFORT	10	9	8
ERGONOMICS	10	9	8
CARGO SPACE*	5	5	5
FEATURES/AMENITIES*	10	2	10
FIT AND FINISH	10	8	9
INTERIOR STYLING	10	9	8
EXTERIOR STYLING	10	10	9
REBATES/EXTRAS*	5	0	0
AS-TESTED PRICE*	20	20	15
SUBTOTAL	90	72	72

POWERTRAIN

1/4-MILE ACCELERATION*	20	19	20
FLEXIBILITY*	5	4	4
FUEL ECONOMY*	10	8	10
ENGINE NVH	10	8	10
TRANSMISSION	10	10	7
SUBTOTAL	55	49	51

CHASSIS

PERFORMANCE*	20	17	20
STEERING FEEL	10	10	8
BRAKE FEEL	10	10	8
HANDLING	10	10	10
RIDE	10	9	9
SUBTOTAL	60	56	55

EXPERIENCE

FUN TO DRIVE	25	25	22
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GRAND TOTAL	230	202	200
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Shell
V-Power
NITRO+
Premium Gasoline
The Official Fuel of
CAR AND DRIVER

*These objective scores are calculated from the vehicle's dimensions, capacities, rebates and extras, and/or test results.

FORD MUSTANG SHELBY GT350

➤ GREAT SHIFTER, NICE STEERING, GOOD RIDE, SUBLIME BODY CONTROL, REVS OUT THE WAZOO.
➤ NOT AS QUICK AS THE CORVETTE, SELL YOURS BEFORE IT VIBRATES ITSELF TO PIECES.
➤ IF PORSCHE'S GT TEAM BUILT A MUSTANG, IT WOULD BE THE GT350.

4.3-second zero-to-60-mph run, or its 12.5-second quarter-mile time. The car is not set up for drag-race launches. Drop the clutch below 4000 rpm and the car will bog a bit as the fat rear tires maintain their death grip on the pavement. Launch it at or above 4000 rpm, while the engine nears its torque peak, and you will roast those tires. That's why the GT350 is only a tenth of a second quicker than the Mustang GT to 60 mph but half a second quicker through the quarter. This is not an issue on the road or the road course. The increased grip of the R variant's gumball tires, and the lower rotational inertia of the R's carbon-fiber wheels [see page 018], puts the Shelby's acceleration number directly in line with the Corvette's.

It's the seamless interaction, that second-nature feel between the GT350's controls and its excellent body discipline, that makes this car feel so eager, so playful, and so fun. Ultimately, it's a heavier thing than the Corvette and, while Ford fits aluminum front fenders, aluminum knuckles, and a carbon-fiber radiator support, the GT350 still carries 53 percent of its weight on the front axle, so it tends to understeer during turn-in relative to the Vette on the track. But that's at the very limit, which you'll seldom visit on public roads. Otherwise, the GT350 acts as if it were raised on the track, so natural does it feel there. On the road it feels planted and alive. This is the perfect balance.

We wish Ford would allow Track-package GT350 buyers to opt for an upgraded stereo or a nav system that would bring a center screen larger than the playing-card-sized unit in our tester. But if engagement is your primary aim, the GT350 Track package is as engaging a performance car as you're going to get for less than the cost of a Porsche GT3. It's that good. ■



MASS & CLASS

*first drive . BENTLEY TAKES
SUMPTUOUSNESS INTO UNCHARTED
TERRITORY. by Jared Gall*

2017 BENTLEY BENTAYGA

048



A silver Bentley Bentayga is shown from a side-rear perspective, driving on a paved road. The background is a blurred landscape of trees and hills under a warm, golden sunset sky. The car's design features, such as the multi-spoke wheels and the 'Bentley' badge on the side, are visible. The overall mood is one of luxury and performance.

BEFORE ASKING WHY BENTLEY IS BUILDING an SUV, first ask yourself what a Bentley should be. In this rarefied realm, excess sells—excess size, excess power, excess capability, excess zeros in the price, and so on. A Mulsanne's spec sheet with the car's height redacted reads like that of a pickup truck. Indeed, a diesel dualie lugging a horse trailer, what with its 752 pound-feet of torque. We're guessing that few Continental GT buyers hit 60 mph just four seconds after leaving a stoplight, and still fewer Flying Spur pilots cruise at 199 mph, even though they could. So just think of a 300-grand Bentayga as exploring a new realm of excess capability.

All the old realms are mastered here, too. Inside, it's a typically roomy SUV, but finished with impossibly intricate woodwork, speaker grilles designed to mimic tweed, a sheet of actual glass—not plastic—over the instruments, and leather that deserves to be scavenged at the end of the Bentayga's life and repurposed into an heirloom sofa. Or, you could just pull out the optional 22-way adjustable front seats and have a pair of cossetting sitting-room recliners with heating, cooling, and massage. Upgrade from the standard five-seat layout with its conventional split-folding rear seat to the optional non-folding rear buckets, and you get two more of

050

02.2016

caranddriver.com

. first drive

these chairs in back at a cost of \$5508 apiece, sans adjustable bolsters. There are 14 seat-belt colors, 15 hide colors, and three different two-tone layouts, plus contrasting or matching stitching and piping. Pick from 17 standard paints, or 90 optional colors, and seven different varieties of veneer.

The options list, of course, runs to absurd lengths and heights, but our favorite is the \$28,000 picnic set. It tucks behind the rear seat, consuming a fair bit of the already-precious cargo room (the Bentayga's 15 to 17 cubic feet behind the back seats is less than you'll find in a Nissan Leaf). But in three bins that can be removed and used as stools, the picnic set has storage for dry goods, a set of Linley china, real silverware, crystal champagne flutes, and two bottles of bubbly—that last bin is refrigerated, of course. Bentayga pricing will start at \$231,825, but the examples on our drive averaged closer to \$290,000, with a handful eclipsing \$300,000.

Time is the ultimate luxury, which is why Bentayga bodies are assembled in Bratislava, Slovakia, alongside Audi Q7s, Porsche Cayennes, and Volkswagen Touaregs. While the others are built using modern assembly methods, the handcrafting that goes into a Bentley—including the ute's new-generation W-12 engine—means Bentaygas require about 10 times as long to build. Having an assembly line where an Audi moves through in 13 hours and a Bentley takes more than 130 would make scaling the workforce difficult, and so Bentayga shells are shipped to Bentley HQ in Crewe, England, for finishing.

Or maybe the ultimate luxury is not time, but a *timepiece*. The Bentayga's most extraordinary and outrageous option—and by “outrageous” we mean both highly unusual and likely to spark outrage if not an outright revolution—is the 150,000 euro, approximately \$160,000, “Mulliner Tourbillon by Breitling.” Translated into common English, that means a clock, one that sits atop the dash. For that imperial price, buyers can spec a white- or rose-gold housing and a black or white mother-of-pearl face studded with eight diamonds. A mechanism in the dash winds the clock as needed. Only a handful of craftsmen at Breitling make the clocks, at a pace of three months per. That exclusivity guarantees that Bentley will sell the four it can offer every year.



↑ CEO Dürheimer, with an impressive Breitling on his own wrist, calls the Bentayga “the world’s most expensive watch winder.”

Hopefully the craftsmen get a cut.

While the Bentayga's silhouette says “crossover,” by measures other than height it is, in fact, a rather tidy Bentley. At 202.4 inches long, it's about a foot and a half shorter than a Mulsanne. Its 5350-pound curb weight is some 600 pounds lighter, or right on par with a W-12 Flying Spur. The floorpan is steel, but most of the rest of the unibody is aluminum, including all exterior panels. Bentley says the body-side is the automotive industry's largest single aluminum stamping.

Air springs and variable damping endow the Bentayga with short-term memory loss of the highest order. Every last road imperfection is forgotten immediately. “Speed bump” is the wrong term for the gnarly, nearly foot-tall obstacles littering the hamlets of southern Spain, where we drove the Bentayga. They merit a more ominous classification, like “abrupt incline/decline events; underbody damage likely.” But in the Bentayga, even these massive wheel displacements happen with zero extra body oscillation. It needs a horn that shouts, “Out of my way, proles!” A Ford F-150 Raptor doesn't soak up bumps this unflinchingly.

The electric power steering is weighty and direct but doesn't offer much feel. By SUV standards, though, it's excellent. As



are the brakes, the pedal firm and progressive. Even when barreling down the switchbacks of the Sierra Blanca mountains, they never hinted at fade. Engineering competent handling into portly cars is a Bentley specialty, and that expertise is on full display in the Bentayga. Sure, you can force it into understeer, but drive it with an understanding that it's a near-three-ton SUV with a W-12 in the nose and you can set it up to flow through turns better than a vehicle this size has any right to.

A large part of that capability is how flat the Bentayga corners. Its outstanding body control is due to the standard Bentley Dynamic Ride, new active anti-roll bars that counteract lean with a pair of electric actuators, one each to stiffen and soften the front and rear bars as needed. They operate on 48 volts supplied by a supercapacitor tucked



▼ SPECIFICATIONS

VEHICLE TYPE: front-engine, 4-wheel-drive, 4- or 5-passenger, 4-door hatchback

BASE PRICE \$231,825

ENGINE TYPE: twin-turbocharged and intercooled DOHC 48-valve W-12, aluminum block and heads, port and direct fuel injection

DISPLACEMENT 363 cu in, 5950 cc

POWER 600 hp @ 6000 rpm

TORQUE 664 lb-ft @ 1350 rpm

TRANSMISSION: 8-speed automatic with manual shifting mode

DIMENSIONS

WHEELBASE 117.9 in

LENGTH 202.4 in

WIDTH 78.7 in

HEIGHT 68.6 in

PASSENGER VOLUME 112 cu ft

CARGO VOLUME 15-17 cu ft

CURB WEIGHT 5350 lb

PERFORMANCE (C/D EST)

ZERO TO 60 MPH 4.0 sec

ZERO TO 100 MPH 9.3 sec

1/4-MILE 12.4 sec

TOP SPEED 187 mph

FUEL ECONOMY (MFR'S EST)

EPA CITY/HWY 14/20 mpg

under the spare wheel. Product line director Peter Guest says that between the bars, actuators, supercapacitor, and heavy-duty cables, which are about four times the normal diameter, the system weighs between 30 and 40 pounds. The upside is quicker response time, but due to the extra weight and cost, don't expect to see the sports-car world rushing to embrace it. Bentley chief executive officer Wolfgang Dürheimer says the system is technically capable of leaning the Bentayga into a turn like a motorcycle but, in the interest of not weirding out passengers, it doesn't. What it does do is allow a firm, controlled ride on-road, with maximum wheel articulation off-road.

To prove that the Bentayga is more than Bentley's take on the Toyota Venza and other pavement-only crossovers, we drove it on dirt, briefly. Initially the trail was

something even a Venza could conquer, but then it wasn't, with side slopes so steep that stepping out for pictures gave us new appreciation for how heavy even an aluminum Bentley door is. Necks craned to see over the hood on the clifflike crests—the forward-facing park-distance camera is a handy way to lower your field of vision—and at one point the Bentayga's nose dug in the dirt and a rear wheel hung at full droop, looking like a dog lifting its leg. Given the extraordinary unlikelihood of owners risking any scratches in their hand-polished paint jobs, the Bentayga lacks hard-core off-road gear such as a low range or locking front or center differentials, but its maximum 9.7 inches of ground clearance enables 25-degree approach and departure angles, with a 22-degree breakover. Those numbers are nothing extreme—the Jeep Wrangler Rubicon's respective measurements are 42, 32, and 26 degrees—but surely they're sufficient for anything a Bentayga will ever face.

The W-12 engine still displaces 6.0 liters but shares no parts with its predecessor. Bentley shaved 66 pounds with this generation, an impressive feat with such a dense brick of moving parts. Engineers pinched ounces from the block, heads, crank, and cams, to name but a few items. Cylinder deactivation shuts down six cylinders when conditions are right, and a "sail mode" decouples the engine from the transmission when the driver is off the throttle at higher speeds. We never noticed either system in operation.

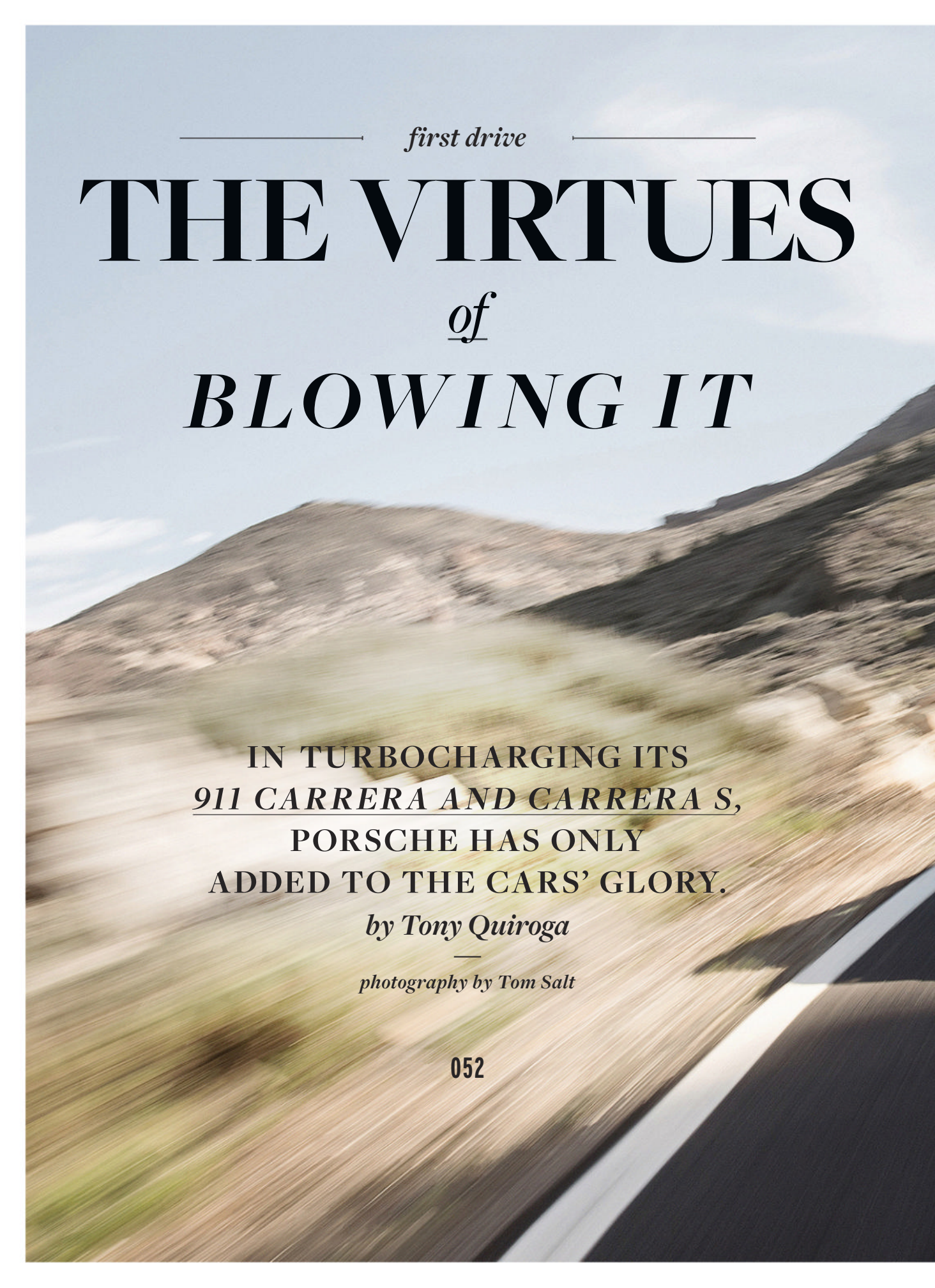
Guest says that twin-scroll turbos are

much of the reason the W-12 is all-new, that engineers couldn't adapt the faster-spooling design to the old engine. They're integrated into the exhaust manifolds now, with three cylinders feeding each scroll. The power is absolutely startling and immediate. The torque curve plateaus at 664 pound-feet at 1350 rpm and stays there until 4500. From 5000 to 6000 rpm, the W-12 is making 600 horsepower. Bentley claims a zero-to-60 time of four seconds flat, and we believe it.

This being the only twin-turbo W-12 on the market, we wish it were allowed to be more vocal, but all you hear from inside is a subdued burr. Guest tells us that not only do the triple-sealed doors keep the Bentayga Bentley-quiet, they also mean off-roading owners won't have to worry about dust. "Once you've insulated for noise," he says, "you've insulated for everything."

But the Bentayga's greatest accomplishment will be the new era into which it ushers Bentley, one of superlative profitability. Bentley initially expected to build 3500 Bentaygas a year but recently revised that figure to 5500. Executives tell us that they may make yet another upward correction before production begins.

CEO Dürheimer was at Porsche when the Cayenne was in development and says that the business plan hinged on selling 20,000 of them a year. In 2015, it sold 87,000, plus 67,000 Macans, all while sports-car sales held steady. Bentley is thriving on 10,000 sales a year. To suddenly increase that figure by 50 percent may be the best kind of excess there is. ■



first drive

THE VIRTUES *of* BLOWING IT

IN TURBOCHARGING ITS
911 CARRERA AND CARRERA S,
PORSCHE HAS ONLY
ADDED TO THE CARS' GLORY.

by Tony Quiroga

photography by Tom Salt



053

2017 Porsche 911 Carrera|Carrera S



Tenerife is a tiny volcanic island poking through the waters of the Atlantic Ocean. Located west of the Sahara Desert, this Spanish outpost combines the topography of Southern California, Mexico, and the Olympus Mons on Mars. It's a fever dream of a place. Weird and magical, it looks like something Gabriel García Márquez or Salvador Dalí would sketch. So it shouldn't surprise you to learn that we're here, driving up the side of a volcano in a nearly 15-foot-long Betty-Blue Jelly Belly.

With the windows down, a faint whistle can be heard from the stern of our ship. That is the sound of Porsche's big news, and it's why we've come all the way to Tenerife. Turbos aren't just for 911 Turbos anymore; the base 911 Carrera and Carrera S are now turbocharged, too, though tradition prevails in the new boxer engine, still tucked behind the rear wheels as Ferdinand and Ferry intended.

Both the Carrera and the Carrera S in this so-called 991.2 model get two turbochargers hitched to a flat-six that is smaller in displacement than last year's naturally aspirated engines. Porsche is downsizing from the Carrera S's 3.8-liter and the Carrera's 3.4-liter to a common 3.0-liter with boosters. Instead of celebrating the democratization of the turbocharger, however, the new turbo engines are being met with suspicion by fans of the crisp response, raspy exhaust, and smooth power delivery of the old naturally aspirated flat-sixes.

Turbos are magical nautilus shells of power, but they create a feel that is different than that of naturally aspirated engines. Early 911 Turbos made you wait, and then they hit with

the subtlety of a three wood to your latissimus dorsi. This could be why these hardcore loyalists are worried. But some of this paranoia can probably be chalked up to another fact: Porsche fans don't like change. They're just getting over the loss of the air-cooled engine and that was in 1998. Now this happens.

We can assure you that there's nothing to worry about. The two turbochargers do great things to the Carrera and Carrera S, but especially the base \$90,395 car. In a poverty-pack 911, the turbocharged six makes 370 horsepower at 6500 rpm, which is 20 more horses than before. The 332 pound-feet of torque represents a gain of 45, and you get it from 1700 to 5000 rpm. The turbo engine has midrange oomph that the 3.4-liter never



The Miami Blue paint (\$3140) is our new favorite Miami-related thing. Carrera S models use new front brake rotors with aluminum hats.



had—the outgoing base engine required big swings of the tach needle to provide meaningful thrust. It's a serious difference. In the old six, peak torque didn't arrive until 5600 rpm, and the engine didn't stand at attention unless you revved it to 4000 or higher.

In the \$104,395 Carrera S, the 3.0-liter makes 420 horsepower and 369 pound-feet of torque. A new impeller less than a tenth of an inch larger and revised engine-management software are the major differences between the sixes in the Carrera and the Carrera S. The S gets more boost, too—16.0 psi to the Carrera's 13.1. Even so, with so much in common between the two new engines, it's not surprising that the S's power flows with the smooth linearity of the base Carrera; there's just more of it.



The tach runs even more urgently toward the 7500-rpm redline, and the acceleration flattens your hair against the headrest. Headrest head is now a thing. Bring a comb.

In both versions, the turbochargers provide power much earlier in the rev range than before, but at low rpm there is a brief spool-up before the real show starts. Still, the push comes quickly, and it's a much harder shove than that of the old engines. In lower gears, there's strong boost by 2000 rpm. There's a clear wake-up at 3000 rpm, and then a mad dash to the redline. Dip in at 3000 rpm and there's no detectable lag, just thrust. Lug it below 2000 rpm in sixth or seventh and the boost takes time to rise. Then again, the old naturally aspirated engines didn't have much gusto at low rpm in upper gears, either.

Our blue bean arrives at the Teide National Park, 6562 feet above the sea. My driving partner and I are on a narrow road through a valley of jagged obsidian rocks. It's both unwelcoming and breathtaking. The 12,198-foot Pico del Teide volcano looms above us, its last eruption in 1909. Unlike us, the Carrera S isn't losing its breath. Unfazed by the thin air, it only requires a stomp of the accelerator to rocket across this Martian landscape.

The straight and flat road allows us to experiment with launching the seven-speed-manual Carrera S. Rev it to 4000 rpm and release the clutch: The rear tires scramble and catch as the revs fall to about 2200 rpm. Porsche claims zero-to-60-mph times of 4.1 seconds for the manual and 3.9 seconds for the seven-speed PDK automatic. Those numbers are two-tenths of a second quicker than Porsche's claims for last year's Carrera S. In 2013, we hit 60 in 4.0 seconds in the 3.8-liter PDK Carrera S. With our test equipment onboard, we expect to beat Porsche's typically conservative numbers by a tenth or two.

According to Porsche, the lower Carrera is just a few tenths slower in the race to 60 mph. Porsche claims zero-to-60 times of 4.4 seconds for the seven-speed manual, 4.2 seconds for the PDK automatic, and 4.0 seconds for the PDK automatic with Sport Plus and launch control. We'd say there's a good chance the PDK-equipped Carrera will crack the four-second barrier when we test it.

Although it's 80 degrees at the beach, the volcano's altitude has cooled temperatures considerably. With the windows up, the whistle of the turbos is gone. The only sound is the characteristic metallic growl of a Porsche flat-six. To ensure that it's heard, a pipe channels intake noise into the cabin. The notes aren't manufactured; it's actual engine sound, just plumbed into the living quarters. A Sport exhaust is optional, recognizable by two round pipes near the center of the rear bumper. It gives the driver the ability to open or close exhaust flaps to further raise the volume.

Opt for the Sport Chrono package and, in addition to a snazzy dash-mounted stopwatch, you get a mode-selector dial on the steering wheel and dynamic powertrain mounts that firm up at times to minimize the movement of all that mass at the rear of the car. Turning the selector moves the car among four different modes: individual, normal, sport, and sport-plus. What the various modes actually change depends on the optional extras on your car. Switching to sport or sport-plus tightens the electronically adjustable shocks. Cars with the Sport exhaust get louder in sport and sport-plus modes. Manual versions gain automatic rev matching in sport and sport-plus. PDK-equipped 911s switch to a more aggressive transmission program that downshifts upon hard braking and holds onto gears like a Rottweiler holding onto a rope. Sport Chrono also adds the launch-control capability to the optional PDK



Opt for the Sport Chrono package and you get this 918 Spyder-style mode selector to tailor engine, exhaust, suspension, and transmission settings.



automatic. In launch mode, the car will automatically rev the engine and dump the clutch to maximize acceleration.

Sport and sport-plus also make the engine slightly more reactive by “priming the pump” through changes in valve and ignition timing. The effect is more exhaust gas blowing through the turbine before boost is called for, which reduces lag.

PDK cars with Sport Chrono also get a small black button, called “Sport Response,” in the middle of the dial. Hit it and the car gives you the full Gary Busey treatment. Powertrain and chassis settings go into their most aggressive modes for 20 seconds of maximum acceleration.

On both the Carrera and Carrera S, the chassis undergoes a number of tuning changes. Electronically adjustable dampers (PASM), now standard on the Carrera, drop the car 0.4 inch. The shocks have a wider range of adjustment, and the rear wheels are a half-inch wider. Carrera S models now offer PASM Sport, which lowers the car another 0.4 inch. The rear-wheel steering from the GT3 and Turbo is now optional. Equipped with all the chassis goodies, the Carrera S is a playful car with big grip.

We head out of the volcanic landscape for the arid forest a few thousand feet down, where the dry pines and rocky terrain look to have been lifted from the hills surrounding Los Angeles. The electric power steering is linear in response and transmits road texture as well as any such



▼ SPECIFICATIONS

VEHICLE TYPE: rear-engine, rear-wheel-drive, 2+2-passenger, 2-door coupe or convertible

BASE PRICE \$90,395-\$104,395

ENGINE: twin-turbocharged and intercooled DOHC 24-valve flat-6, aluminum block and heads, direct fuel injection

DISPLACEMENT 182 cu in, 2981 cc

POWER 370 or 420 hp @ 6500 rpm

TORQUE 332 or 369 lb-ft @ 1700 rpm

TRANSMISSIONS: 7-speed manual, 7-speed dual-clutch automatic with manual shifting mode

DIMENSIONS

WHEELBASE 96.5 in

LENGTH 177.1 in

WIDTH 71.2 in

HEIGHT 50.6-51.3 in

CARGO VOLUME 14 cu ft

CURB WEIGHT 3200-3300 lb

PERFORMANCE (C/D EST)

ZERO TO 60 MPH 3.7-4.2 sec

ZERO TO 100 MPH 9.2-10.2 sec

1/4-MILE 11.7-12.4 sec

TOP SPEED 182-191 mph

FUEL ECONOMY (C/D EST)

EPA CITY/HWY 21-23/28-30 mpg

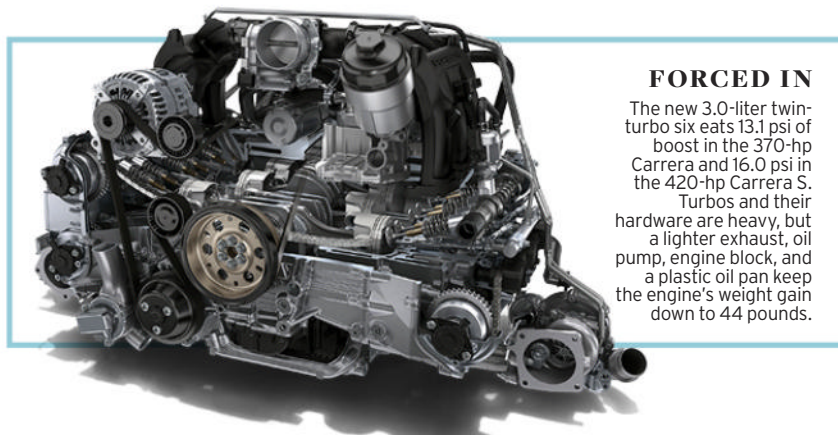
calipers and thicker front rotors. Carrera S models get larger and lighter “floating” front rotors located on the aluminum hub with pins. The pads are larger, too, and come directly from the 911 Turbo. Pony up for the \$8520 carbon-ceramic brakes and you get the 16.1-inch rotors and six-piston calipers in front and 15.4-inch rotors from the 911 Turbo S in back.

Design pitched in with new headlights, front and rear bumpers, and taillights. The grille over the engine is different and feeds air to the intercoolers. Inside, the touch screen wakes up to a passing hand and now incorporates Apple CarPlay.

The recent proliferation of turbochargers has been driven largely by fuel-economy demands, so they aren’t the performance symbols they once were. We can’t say for sure if Porsche’s new engine has increased the 911’s fuel mileage until official EPA estimates are released. But we can say that the turbocharger and the added power have increased the symbolic mileage of the 911 concept. The regular 911 has never felt so good. Porsche’s careful turbocharger integration manages to maintain the involving character, sound, and high-revving bliss of the 911’s naturally aspirated predecessors. It worked brilliantly in the varied terrain of Tenerife, which means it’ll work on Mulholland Drive, in Mexico City, and on Mars. ■

system we’ve touched. There’s a GT3-style hungriness to the chassis. The 911 urges you toward higher cornering speeds, and it’s easy to run fast in perfect safety and control. Porsche’s stability-control system now offers three modes: on; PSM sport, which diminishes intervention; and full off.

In the interest of slowing things down, Porsche changed the brakes, too. Carrera models get new, larger four-piston front



FORCED IN

The new 3.0-liter twin-turbo six eats 13.1 psi of boost in the 370-hp Carrera and 16.0 psi in the 420-hp Carrera S.

Turbos and their hardware are heavy, but a lighter exhaust, oil pump, engine block, and a plastic oil pan keep the engine’s weight gain down to 44 pounds.

POWER TRAINED



With a substantial 279-horsepower engine and Variable Cylinder Management™ to help maximize fuel efficiency,* the 2016 Acura RDX gives you performance that's exhilarating and responsible. Hit the start button, and you'll see how much more satisfying power is when it's smartly used.



THE 2016

RDX

DRIVE LIKE A BOSS

RDX with Advance Package shown. *20 city/29 highway/23 combined mpg rating for RDX FWD model. Based on 2016 EPA mileage ratings. Use for comparison purposes only. Your actual mileage will vary depending on how you drive and maintain your vehicle. ©2015 Acura. Acura, RDX, and the stylized "A" logo are registered trademarks of Honda Motor Co., Ltd.

GOING TO THE DOGS

Four semi-autonomous cars that are itching to prove they're better at driving than you. Or your pet.

Autonomous driving—what the high-minded call artificial intelligence and what we call real brainlessness—may not be as vile as we originally feared. One DeLorean DMC-12 directed by a Stanford University engineering crew can perform perfect opposite-lock, tire-cooking, hands-off donuts at will for as long as the rubber lasts. Lead professor Chris Gerdes explained the rationale underlying this class project, timed to coincide with the fictional arrival on October 21, 2015, of the time-traveling *Back to the Future* DeLorean: “When we no longer have a human driver in the loop, we think that the automated vehicle should be able to harness the full range of vehicle operating capabilities to avoid collisions, even if this means going sideways a bit to stay on the road.” In other words, loading \$60,000 worth of navigation gear, two powerful electric motors, and shrewd software into a 30-year-old sports car may have just fried Google’s autonomous eggs.

by Don Sherman
photography by Michael Simari



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02.2016

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tech
feature

While on-demand drifting will likely remain in your dreams for the time being, cars programmed to perform other feats are now commonplace. Anti-lock brakes and stability control have been mandatory for years. Lots of cars sound an alarm, shake the seat, and/or nudge the steering wheel when you leave your lane without signaling. Adaptive cruise control that automatically maintains a safe distance from the car ahead is also widely available. Ten manufacturers recently committed to making automatic emergency braking standard across their entire lineups.

Brainless driving is closing in on us like a meteorite because of its potential to avoid accidents. Sadly, we are a nation of mediocre drivers, distracted on our daily journeys by dining, child rearing, makeup applying, and incessant texting. Driver's ed. is a shadow of its former self, and few of us are able to use the accident-avoidance capabilities built into every new car. Our driving errors cause crashes, injuries, and fatalities.

So while we're getting worse behind the wheel, the sensors and algorithms capable of saving us from ourselves are getting better. And though we're not convinced that this will ever yield totally hands-off personal transportation, scores of manufacturers are working feverishly to prove us wrong [see "Progress, of a Sort" sidebar].



To gauge progress on the path to brainlessness, we've gathered the four luxury cars that have done the most to purge human frailties from the acts of cruising, braking, and steering.

As usual, our test regimen is a balanced mix of on-road evaluations and proving-grounds tests. Other than noting which car can and which can't steer you snugly against a curb, we skipped automatic-parking maneuvers. All these cars and many

others on the market keep watchful eyes on your blind spots, a second form of artificial intelligence we're taking for granted here. To verify that adaptive cruise control works to maintain a safe interval between your car and the one immediately ahead when an intruder barges into your lane, we used a foam-filled Volkswagen Golf decoy owned by Bosch to supplement our over-the-road observations. Our main focus was automatic lane keeping: how well these four early semi-autonomous cars guide you safely and securely while relying on their electronic wits instead of the driver's hands, eyes, and judgment. Using a 50-mile mix of freeway stretches, rural two-lanes, and city streets, we tabulated exactly how many guidance interruptions were caused by broken lane marks, inconsistent pavement patches, intersections, and exit and entrance ramps. We also noted when a car lost the lane-keeping sense for no apparent reason. Then we ranked the four contenders according to the number of control lapses each test car experienced.

So cinch up nice and tight, because there's going to be a lot of near misses.

4th place: Infiniti Q50S

As the first car on the road with steer-by-wire capability (don't fret, there are mechanical backups), Infiniti's mid-size four-door is armed and ready to relieve your brain of some driving tedium. It's not

THE ROUTE

Michigan roads present a daunting challenge to hands-free driving because of their abysmal repair standards. Showing no mercy, we mapped a 50-mile run fraught with interrupted lane markings and patched pavement.

FREEWAY

Thirty miles of freeway revealed how these vehicles dealt with traffic and lane markings ranging from nonexistent to perfect. In addition to wet and night driving, we experienced one stop-and-go jam, during which the Mercedes-Benz S65 temporarily suspended its hands-on-the-wheel requirement.

RURAL

Two-lane roads in generally good repair accounted for approximately one-fourth of the route. Each of the cars stumbled when encountering side roads and intersections, necessitating hands-on help.

TURN-AROUND

CITY

Out of curiosity, we included a run down Ann Arbor's Main Street as part of our route. As you might imagine, curbs and parked cars don't define your lane of travel nearly as succinctly as a continuous white line. All four cars struggled guiding themselves here.





**BOSCH'S
FOAM-FILLED VW
GOLF PROVIDED
A SAFE MEANS
OF SIMULATING
RUDE LANE
INTRUDERS.**



only smart enough to apply the brakes when the car ahead in your lane slows, it's supposedly capable of leap-frogging that car to detect when a driver two spots ahead impedes traffic flow.

We didn't verify that capability, but we did use both normal traffic and Bosch's lane-intrusion tool to confirm that the Q50 will forcefully apply the brakes to avoid a rear-ender when the space between you and a car ahead is suddenly diminished. Our only gripe is that the maximum car-to-car interval provided by this adaptive cruise control is a bit short for our tastes. While the owner's manual lists a 200-foot margin at 60 mph, the gap we observed felt substantially shorter. (The three other cars in this examination also passed the adaptive-cruise-control interruption test with flying colors.)

Activating the Q50's Active Lane Control and Lane Departure features, part of a \$3200 Technology package, and Direct Adaptive Steering from the \$3100 Deluxe Touring package requires a visit to the vehi-

↑ The Infiniti Q50S sees lane markings with a windshield camera. Rain and darkness posed no issues, but this system lost path control more frequently than the others.

cle-systems settings menu and a tap of a switch on the right steering-wheel spoke. These driving aids work with or without cruise control engaged by monitoring the edges of your lane of travel with one forward-looking camera. On our route, with lane markings that ranged from abysmal to perfectly clear, the Q50's hands-free lane-keeping ability was a mixed bag. On straight sections it worked nicely even in the rain, which gives some car cameras fits. But in mild curves, and when lane markers were interrupted by entrance and exit ramps or intersections, it lost the scent. The Q50 would wobble the full width of the lane before sounding three gentle beeps to signal the need for helping hands on the wheel. Our sincere apologies to those drivers behind us on I-94.

One of the Q50's distinctive traits is that its steering wheel remains dead still

when this car's path is under Direct Adaptive Steering control. That's interesting, but what matters more here is how well this Infiniti locks onto and holds a lane hands-free, which, as we found out, is not that well. Logging 93 interruptions on the 50-mile route, the Q50 finished dead last in this group by a wide margin.

3rd place: Mercedes-Benz S65 AMG

Mercedes dipped a toe into the semi-autonomous pool three years ago with the introduction of the sixth-generation S-class. Proceeding cautiously in waters infested with liability sharks, Mercedes offers its DISTRONIC Plus with Steering and Active Lane-Keeping Assist as standard

↓ Here are two instances where one or both lane markers are clear and continuous. Nonetheless, the Q50S lost its way, handing steering control back to the driver.



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feature

→ The Golf intruder slides on Delrin pucks with propulsion provided by a mothership. In the event of a mishap, the closing car simply climbs up and over the Golf's low-profile carriage.

equipment on some S-class models and optional on others. (It's standard on the S65 and part of a \$2800 Driver Assistance package in the base S550 sedan.)

Pressing two buttons located to the left of the instrument cluster enables this system of bundled functions. When you're ready for lazy driving, a tug of the cruise-control stalk activates adaptive cruise control, lane keeping, and hands-off steering. Once the S-class's nervous system locks onto lane markings, a small gray steering-wheel symbol in the cluster glows green.

At cruising speed, this hands-off function lasts 12 seconds, then the green wheel turns bright red, presenting three options: Do nothing and you're scolded after a three-second delay by a reminder tone, though the lane-keeping function does continue; you can give the wheel a quick left-right tug to reset the 12-second clock; or simply take over and steer the good old-fashioned way.

We experienced scores of dropouts on our 50-mile route (not counting the times we reset the hands-off-driving clock). These interruptions were triggered by lane markers obliterated by pavement patches, intersections, and edge-mark lapses at freeway entrance and exit ramps. But overall, Distronic Plus, which sees the road with one stereo camera and five radar sensors, works surprisingly well. There was minimal loss of functionality during night driving and in rainy conditions.

During one lengthy stretch of stop-and-go freeway traffic, steering and lane-keeping assistance both remained active indefinitely with the red-wheel icon (remember it usually lights every 12 seconds if your hands aren't grasping the wheel) mercifully on hiatus. To our chagrin

as dedicated drivers, automatic control over speed and direction while the car crept forward was quite relaxing. So give the Benz an honorable mention for its exemplary traffic-jam behavior (especially if you commute anywhere near Los Angeles) and a third-overall rank resulting from the 58 dropouts the S65 accrued on our test route.

2nd place: BMW 750i xDrive

To make its stand in the luxu-tech wars, BMW introduced the ominously named Active Driving Assistant Plus as \$3600 optional equipment on its new 2016 7-series flagship. The functions mirror that of the Mercedes with a couple of exceptions. Here, the controls are mounted in plain sight on the left steering-wheel spoke, instead of hidden behind the wheel on a



↓ Mercedes-Benz arms the S65 with nearly as many sensors as a SpaceX Falcon 9 rocket. But the S-class interior is a whole lot nicer than anything destined to leave our atmosphere.



THE S65'S
GREEN
STEERING-WHEEL
ICON INDICATES
HANDS-FREE-
DRIVING
READINESS.



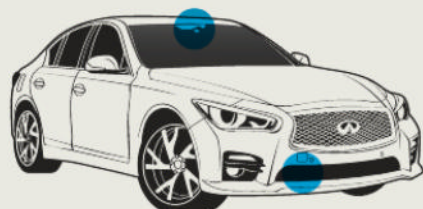
THE PHYSIOLOGY OF SEMI-AUTONOMY



PRICE AS TESTED \$129,245
BASE PRICE \$98,395
DRIVING-AID SYSTEMS: Driver Assistance Plus, Active Driving Assistant Plus
NERVOUS SYSTEM: 1 stereo camera, 5 radar sensors

2016 BMW 750i xDRIVE

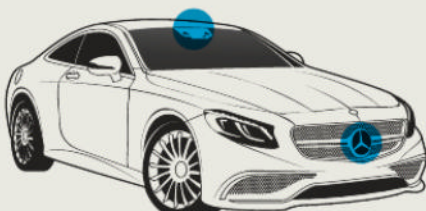
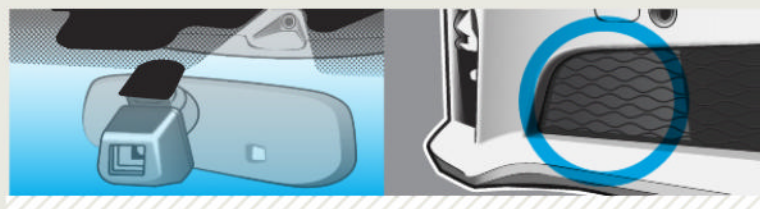
A stereo camera located near the rearview mirror gives the BMW depth perception to identify pedestrians and lane markings. Five radar units, including one in the lower grille, monitor traffic from every direction.



PRICE AS TESTED \$54,055
BASE PRICE \$44,555
DRIVING-AID SYSTEMS: Intelligent Cruise Control, Predictive Forward Collision Warning, Forward Emergency Braking, Lane Departure Warning/Prevention, Active Lane Control
NERVOUS SYSTEM: 1 camera, 1 radar sensor

2015 INFINITI Q50S

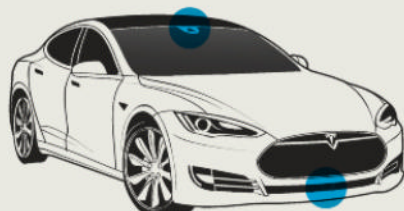
One windshield camera provides vision for lane control while others operate the rain-sensing wipers and automatic high-beam control. Radar at the left side of the grille enables adaptive cruise control.



PRICE AS TESTED \$252,675
BASE PRICE \$233,525
DRIVING-AID SYSTEMS: Distronic Plus with Steering Assist, Adaptive Brake Technology, Active Lane-Keeping Assist
NERVOUS SYSTEM: 1 stereo camera, 5 radar sensors

2015 MERCEDES-BENZ S65 AMG COUPE

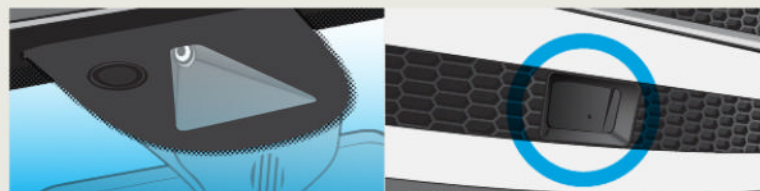
Like BMW, Mercedes uses a stereo camera system mounted behind the windshield to see lane markings, plus an array of five radar units looking forward and to the sides to spot both nearby and distant traffic.



PRICE AS TESTED \$136,720
BASE PRICE \$106,200
DRIVING-AID SYSTEMS: Autopilot, Autosteer, Auto Lane Change, Autopark, Traffic-Aware Cruise Control
NERVOUS SYSTEM: 1 camera, 1 radar sensor, 12 ultrasonic sensors

2015 TESLA MODEL S P85D

One windshield camera and a radar sensor mounted low in the grille give the Model S what seems like 20-20 vision. Ultrasonic sensors (not shown) check for a clear path to the side before enabling a lane change.



C/D TEST RESULTS

	BMW	INFINITI	MERCEDES	TESLA
CRUISE-CONTROL-SETTING RANGE, MPH	19-106	19-109	20-118	18-89
CRUISE-CONTROL RESPONSE TO LANE INTRUDER	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT
NUMBER OF LANE-CONTROL INTERRUPTIONS ON 50-MILE ROUTE	56	93	58	29
LANE CONTROL AT NIGHT, IN RAIN	GOOD	GOOD	GOOD	GOOD
WHEEL FORCE TO REGAIN STEERING, LB	2	4	3	4
LANE-CHANGE ABILITY	NO	NO	NO	YES
PARKING ASSISTANCE	YES	NO	YES	YES

stalk. Another notable difference is that BMW gives you only three seconds of totally hands-off steering assistance before a green steering-wheel icon turns yellow (with assistance still in force for seven more seconds), then red (assistance suspended).

Simply touching the steering wheel reboots guidance. Experimenting, we learned that light pressure from two fingers—without any actual steering—was the minimum required to convince the capacitive rim sensor that a brain was present to supervise the 750i's progress.

In addition to the green, yellow, and red symbols, Active Driving provides steering-wheel vibrations that can be adjusted to three intensities. It's capable of tracking via lane markers (indicated by green-lit lines to the sides of the steering wheel) or by following a car ahead (marker lines not illuminated).

BMW's hands-off steering works at night and in the rain. As is the case with the Infiniti and Mercedes systems, there are lapses in sweeping bends or when exit and entrance ramps interrupt one lane stripe, for example. City streets also foil this equipment; occasionally the BMW lost the trail on clearly marked straight sections of



↑ When the BMW's steering-wheel icon glows bright red, the car suspends its lane-keeping assistance, and you must promptly resume fingers-on steering responsibilities.

pavement for no obvious reason at all.

The 56 interruptions we tallied on our drive route and a lower overall need for minding the wheel gave the BMW 7-series a huge jump on the Infiniti Q50S and a thin edge over the Mercedes S-class.

1st place: Tesla Model S P85D

The sedan that begs to differ is this test's clear winner. With utmost confidence and only two cautions from legal counsel—"Always keep your hands on the wheel. Be prepared to take over at any time"—the Tesla Model S locks onto the path ahead with a cruise missile's determination and your hands resting on your lap. Tesla's Tech Package with Autopilot costs \$4250 and uses one camera and one radar sensor.

A thin control stalk tucked behind the left steering-wheel spoke commands the cruise-control speed (up or down clicks), the interval to the car ahead (twist of an end switch), and Autosteer initiation (two quick pulls back). A chime signals activation, and the cluster displays various pieces of information: the car ahead, if it's within radar range, and lane marks, illuminated when in use for guidance. A steering-wheel symbol glows blue when your steering input is no longer needed, and Tesla's gauge cluster also displays the speed limit and your cruise-control setting.

The Model S knows its way via two tracking mechanisms: locking onto the car ahead or sighting the lane marks. When there's difficulty reading the road, a "Hold Steering Wheel" advisory appears. If lane keeping is interrupted, a black wheel

← All four test cars aced the lane-intrusion collision-avoidance test. But, as revealed below, the 750i sometimes had issues finding the center of a traffic lane even when there was no apparent problem with the lane markings.





THE MODEL S CLEARLY DISPLAYS KEY DATA SUCH AS CRUISE-CONTROL SPEED AND AUTOPILOT ENGAGEMENT.

↑ The hapless foam-filled Golf showed up prominently in the Tesla Model S's radar beam, facilitating yet another not-very-close brush with lane-intrusion death.

gripped by red hands and a "Take Over Immediately" message appear on the dash. Failing to heed these suggestions cues chimes, and if you ignore all the audible and visible warnings, the Model S grinds to a halt and flashes its hazards. A heartbeat detector is not included.

The Tesla's Autosteer performance can be distinguished from our other contenders by two words: no wobbling. This car identifies the exact center of your lane of travel and holds that course with minimal deviation. This system rises well above parlor-trick status to beg your use in daily driving.

Also to Tesla's credit, this is the only car capable of hands-free lane changes. You simply use the turn signal the normal way and the Model S glides smoothly into the next lane after verifying that there's space to do so safely. To move two lanes, you must signal that desire with two separate flicks of the stalk. This function also can be used on freeway entrance and exit ramps. Of course, you must check the cruise control's



set speed to make sure you don't exceed the car's cornering grip on a tight ramp.

A rainy night laced with heavy spray from adjacent traffic did dent lane keeping's confidence, let's say by 15 percent, but by tallying only 29 interruptions in 50 miles, Tesla's Autopilot app lives in a class of one.

This comparison test reminded us how much pleasure we reap from the simple act of controlling our speed and place in the grand traffic stream. And it has convinced us that the best feature of any autonomous-driving technology is an off switch.

Our view is hardly universal. In fact, a dissenting outlook exists where you'd least expect it. Toyota president Akio Toyoda recently speculated that: "In the other world, the fun-to-drive world, autonomous driving technology will let drivers who are really interested in driving attain driving skills beyond their actual capabilities. There is a gap between the driver's natural ability and what they want to obtain. Autonomous driving will fill that gap."

But Akio, if computers handle all the thinking and acting, how will a driver's natural ability ever improve? ■

PROGRESS, OF A SORT: AUTONOMOUS MILESTONES

- Over the course of six years and more than a million miles of autonomous driving, Google prototypes have suffered only a dozen or so fender benders. Google claims that its vehicles, governed at 25 mph, weren't at fault.
- A Mountain View, California, motorcycle cop pulled over a Google car driving 24 mph in a 35-mph zone for impeding traffic. Regrettably, no ticket was issued.
- Toyota recently recruited DARPA robotics head Gill Pratt, arming him with a five-year, \$1 billion budget to pursue artificial intelligence and robotics technology. With fingers crossed, Toyota president Akio Toyoda wished, "One hundred years from now, I would like vehicles to remain loved by people."
- German media speculates that Apple may team with BMW on Apple's i3-based Project Titan.
- Last year, Audi's "piloted driving" A7 traveled 560 miles from Silicon Valley, California, to Las Vegas, Nevada, with minimal driver input, experiencing both open-road and city-traffic situations.
- Porsche's InnoDrive uses onboard-navigation data to improve cruise-control speed and fuel efficiency during twisty-road driving. Audi may be the first to introduce this system in European models ["Corner Worker," May 2015].
- At last fall's Tokyo auto show, Nissan presented its latest Intelligent Driving System concept, combining artificial intelligence and electric propulsion, describing the car as "relaxing in a living room."
- Renault-Nissan claims 10,000 employees at work on autonomous-driving commercialization.
- MIT's Persuasive Electric Vehicles combine Uber, electric propulsion, and autonomous driving in experimental three-wheelers programmed to carry one passenger or cargo in cities.
- Following Tesla's push of its Autopilot software last October, YouTube was rife with back-seat "driving" and other stunts, such as the one on page 059. Tesla boss Elon Musk announced "additional constraints" to follow, though no details were included. —DS



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*Get behind the wheel of
a surplus Humvee,
no enlistment required!*
by Ezra Dyer

—photography by Clint Davis



The AM General High Mobility Multipurpose Wheeled Vehicle occupies an extremely weird place in American automotive culture. It's a military machine, the official transportation of the world's finest hellholes. But it's also the basis of the former Hummer H1, a six-figure attempt at a domestic Geländewagen and a glamorous co-star in the silliest car chase in movie history (see: *The Rock*). Until very recently, you've only driven one of these things if (A) you once wore fatigues and answered to Uncle Sam, or (B) your successful New Jersey nightclub needed a tax write-off for a friggin' business vehicle.

About a year ago, though, a third possibility emerged: private ownership for the ex-military machines. Online heavy-equipment auction site IronPlanet bid on a government contract for "disposal of surplus product," meaning Humvees made obsolete by the new Oshkosh Joint Light Tactical Vehicle [see "I Want My JLTV," January 2016]. Prior to IronPlanet's involvement, "disposal" meant just that—most old Humvees were sold for scrap (though they're not hard to find on eBay, either). The pitch to the government was simple: Don't scrap these things, sell them. You'll generate more money, and the public will get surplus Humvees for a fraction of the price of an H1.

So far, about 2500 Humvees have been honorably discharged from military bases to private ownership, a process that got easier last summer when IronPlanet began offering Standard Form 97, "The United States Government Certificate to Obtain Title to





The last time we tested a vehicle that warned us to not step on parts of the engine was never. The last time we needed to wear waders to test a vehicle, well, we're not talking about that.



a Vehicle.” That crucial piece of paperwork allows buyers to prove ownership, and from there one can pursue the quest for a license plate, although IronPlanet isn’t making any promises on that front. For instance, it’s easy to imagine that California might actively thwart the proliferation of menacing diesel troop carriers on its thoroughfares. Whereas in Texas, the DMV clerk might compliment your sidearm and “Don’t Tread on Me” belt buckle while handing over a vanity plate that reads “SECEDE.” Check your state guidelines before bidding.

And then examine your expectations, because a Humvee is unlike any production vehicle you’ve ever driven. Even in luxed-up H1 guise, the Humvee was never known as a friendly, or even competent, on-road machine. You won’t want to buy one of these because you’re thinking it’ll replace your Jeep Wrangler for your daily commute. You do want one, though, if you’re looking to build your post-apocalyptic hideout atop a 60-degree slope surrounded by a five-foot-deep moat. Neither of those obstacles poses a problem for a properly equipped Humvee, which makes it the perfect thing to park in your EMP-proof cement bunker.

We drove a 1987 M998 at Outback Motorsports Complex, a 600-plus-acre off-road playground in Laurinburg, North Carolina. As an early model, the M998 featured GM’s 6.2-liter diesel V-8 instead of the later 6.5-liter, and its green camo hinted at a Cold War anti-Commie assignment rather than more recent sand-toned adventures. The paint is a clue about each truck’s past, but beyond that you’re on your own. IronPlanet’s oil-sample analysis is as close as you’ll get to a Carfax report. But, given the prices—our test truck, with hardtop and LED headlights, sold for \$18,250—it can be worth taking a flier on a rig with supernatural off-road abilities.

The naturally aspirated 6.2 hammers out 150 horsepower and 250 pound-feet of torque. With full-time four-wheel drive, 37-inch Goodyear Wrangler MT radials, and a 5400-pound curb weight, the M998 is like the anti-Hellcat; traction is absolute. Its torque-sensing differentials don’t lock, but you can ride the brakes and coax them into acting like lockers, depending on the situation. Like maybe you need to climb a 60-percent grade. And that grade is covered in bacon grease and ball bearings. Then you might need the brake trick.

With the optional fording kit, the Humvee can handle water that’s 60 inches deep. Now, the truck is 72 inches tall. Do the math and you realize that the engine won’t be the only thing breathing through a snorkel in 60 inches of water. You know you’ve got a serious off-roader when you might need scuba equipment to drive it.

A standard Humvee seems as if it’ll handle water deep enough to float a Chesapeake oyster dredge. At Outback, there’s a pond that regularly swallows trucks. The good ship Humvee took a wave over the bow and kept plowing forward unperturbed as water sloshed in over the side sills. In lesser trucks, you’d worry about smashing a diff on some hazard beneath the surface, but AM General had the



SPECIFICATIONS

1987 CSI M998 HMMVV 1-1/4-TON CARGO TROOP CARRIER

VEHICLE TYPE: front-engine, 4-wheel-drive, 4-passenger ex-military truck

PRICE \$18,250

ENGINE TYPE: pushrod 16-valve diesel V-8, iron block and heads, direct fuel injection

DISPLACEMENT 379 cu in, 6217 cc

POWER 150 hp @ 3600 rpm

TORQUE 250 lb-ft @ 2000 rpm

TRANSMISSION: 3-speed automatic

DIMENSIONS

WHEELBASE 130.0 in

LENGTH 180.0 in

WIDTH 86.0 in

HEIGHT 72.0 in

CURB WEIGHT 5400 lb

PERFORMANCE (mfr's est)

ZERO TO 30 MPH 8.0 sec

ZERO TO 50 MPH 24.0 sec

TOP SPEED 70 mph

good sense to tuck the drivetrain high in the fuselage, sending torque to the wheels via geared hubs. The result is 16 inches of ground clearance and a smooth underbody, allowing the truck to straddle substantial obstacles. The flat bottom also allows you to pick up a Humvee with a forklift, which could be a ballsy antitheft precaution for a vehicle that doesn’t have a keyed ignition.

Spartan interior aside, the M998 actually has a nice ride. Maybe that shouldn’t be a surprise, given the tall sidewalls and long-travel independent suspension, but the Humvee’s reputation suggests relentless brutality, a nonstop sensory assault of cranium-shaking violence. It’s pretty smooth and not even all

that loud. The hardtop makes alarming creaks at the windshield header as the body flexes beneath it, but there’s an easy solution for that: Lose the top and the doors. Then you’ll have an open-air four-door 4x4. Like a Wrangler Unlimited, but one that escaped from a secret government-research facility where it was subjected to bizarre experiments that left it with off-road superpowers.

Outback’s trail system includes sand, mud, and even a dense cypress swamp that approximates a jungle. The Humvee was undaunted by any of it. The swamp trails, however, did highlight the Humvee’s primary off-road liability: Designed for stability (it can handle 40-percent side slopes), the truck is more than seven feet wide. So if the trail is less than seven feet wide, well, it’s gonna be seven feet wide by the time you come out the other side.

A brief sojourn onto pavement confirmed that the Humvee does not care for the ways of civilized society. Its zero-to-50-mph claim is 24 seconds. The top end is supposedly 70 mph, but attaining that speed would require the courage of a thousand Richard Nobles. At 55 mph, mechanical sympathy prompts you to back down to 45, lest the elderly GM V-8 toss its crankshaft through the oil pan.

Mechanical gremlins of various sorts are probably to be expected, given that government Humvees did not likely lead easy lives. On the topic of auctioned Humvees, a currently serving military man asked us, “Why *wouldn’t* you want to buy a 25-year-old off-road vehicle that’s only ever been driven by recent high-school graduates who don’t own it?”

He’s got a point. Perhaps GM 6.2s and 6.5s aren’t hard to find, but axles and hubs might be another matter. And right now, with trucks just beginning to hit the civilian market, there’s no such thing as an AM General junkyard.

That’s why savvy preppers will tell you it’s smart to buy a used Humvee, but it’s even smarter to buy two. ■

PROMOTION



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LONG-TERM TEST

— 2015 HONDA FIT EX —

075

IT CONTAINS MULTITUDES

Our Honda Fit was a long-term loner. But it had a rich interior life. *by K.C. Colwell*

Every Monday, each of us selects the cars we are going to drive for the week from those available in the office lot. Some weeks are better than others. There was that time AMG sent us every model it makes, which made every other trip of the calendar feel somewhat underpowered. Most weeks are like that cruel recess scenario played out in schoolyards, where the unpopular kid gets picked last. For the last 15 months, the most affordable, least powerful, and most utilitarian long-term car in our fleet has been a 2015 Honda Fit, living a lonely existence.



↑ This generation of Fit is less fun to drive than the previous two, but the upholstery pattern reminded us of Q*bert, which was fun.

The Fit wasn't routinely ignored because it is a bad car; rather, it was simply the most basic four-wheel transportation on our scheduling board. There were no seat heaters in this Fit, no nav or satellite radio, minimal seat controls, and also the sense that sound insulation was cut to keep down costs. This is metronomic A-to-B transportation.

Were it not for the superb chassis of the previous two generations of Fit, we would not mourn that this third-gen's steering has gone numb, or that the shifter has lost some of its crisp action. This redesigned Fit, however, did maintain its status as a packaging marvel, feeling huge on the inside despite its tidy exterior dimensions (achieved by positioning the fuel tank under the front seats).

Fold down the rear seats to reveal a cargo hold seemingly designed by an Air Force C-5 loadmaster. It's rated at 53 cubic

feet but feels far more cavernous. Four wheels and tires, a floor jack, and a few fuel cans leave enough room for a cooler of beer. It seems to have more room back there than many three-row SUVs, which coincidentally cost three times as much.

We requested an EX model because it's the highest-spec manual-transmission Fit these days. With an out-the-door price of \$18,225, Honda's cheapest car costs a fraction of what many of our other 40,000-milers do.

The Fit struggled for attention among a long-term fleet that included a BMW M3, a Chevy Corvette, a Porsche Cayman S, a Subaru WRX, and a Volkswagen GTI. That is, until it was needed to do what it does best: Move people or things that seem disproportionately large in comparison to the Fit's pint size.

Six-foot-three-inch technical editor Eric Tingwall was departing for an 1100-mile round trip to upstate New York with three equally tall friends of Scandinavian descent when he found himself confronted with a Catch-22 of sorts, having to choose between sufficient physical space (the Fit) or a higher level of interstate serenity (pretty much everything else in the lot). He said: "I never would have chosen the Fit for a drive this long—too buzzy and loud, among the other comfort-related shortcomings built into

★ BAUBLES AND BOLT-ONS

Chargelt! Jump

We receive a lot of completely useless junk in the mail. When the Chargelt! Jump battery quick-charger arrived, we were skeptical of its claimed ability, mainly because there is an exclamation point in its name. It also provides two USB ports, suggesting it is adept at powering a tablet. When the Fit's battery died, we put Chargelt! to the test and, much to our astonishment, it worked. In fact, the pack, with 200 amps of cranking power, worked so well on the Fit that we connected it to a 1995 Mitsubishi Eclipse that had been parked and melting into our lot for three years, a car that was missing a battery completely (though we don't recommend you do this because the alternator could damage the booster). The exclamation point was earned when the tiny, roughly six-by-three-by-one-inch battery started the Eclipse and allowed us to move it four parking spots over so our landlord wouldn't tow it. The \$100 price tag (www.digitaltreasures.com) buys you the battery, AC and DC chargers, a carrying case, a set of jumper-style alligator clips, and a three-connection USB pigtail. We're gonna have to give Yahoo! another look. —KC



2015 HONDA FIT EX

▼ SPECIFICATIONS

VEHICLE TYPE: front-engine, front-wheel-drive, 5-passenger, 4-door hatchback
PRICE AS TESTED \$18,225
BASE PRICE \$18,225
ENGINE TYPE: DOHC 16-valve inline-4, aluminum block and head, direct fuel injection
DISPLACEMENT 91 cu in, 1498 cc
POWER 130 hp @ 6600 rpm
TORQUE 114 lb-ft @ 4600 rpm
TRANSMISSION 6-speed manual
WHEELBASE 99.6 in
LENGTH 160.0 in
WIDTH 67.0 in
HEIGHT 60.0 in
CURB WEIGHT 2578 lb

WARRANTY
 3 years/36,000 miles bumper to bumper
 5 years/60,000 miles powertrain
 5 years/unlimited miles corrosion protection

MODEL-YEAR CHANGES
2016: None.

every cheap car. But really, what car in our long-term fleet has more real-world leg-room? Not the VW GTI, not the Subaru WRX, not the Mazda 3, and not the BMW M3.” He may have returned from the Adirondacks with a distinctive 1.5-liter ring in his ears—the Fit’s engine spins at 4000 rpm at 80 mph—but at least he and his compatriots weren’t stiff legged.

It’s the Fit’s usability that keeps it competitive in the sub-\$20K market. Yes, the car fell off our 10Best list with this new generation, but that’s only because the entertainment factor took a nose dive. Its value and practicality are still fantastic, even if we did find little irritants. Exhibit A: The radio volume is controlled via a capacitive-touch slider, which occasionally doesn’t react as desired. We avoided it, choosing to use the volume buttons on the steering wheel. One editor wondered how the fussy radio interface made it through Honda’s approval process when the climate control has a conventional three-knob setup including a manual slider—it gives a satisfying “thwoosh-whooapp” sound when you move it—that switches between fresh air and recirculation.

We averaged 34 mpg, topping every gas-powered long-term car of the last 10 years with one exception, the 39-mpg-sipping 2010 Honda Insight [“Insight’s Twilight,” November 2011]. With a 10.6-gallon tank, the Fit should be good for 350 miles between fuel stops. Alas, but we rarely went that far. Even when cruising on the highway with the consumption leaning out to 37 to 39 mpg, the Fit only went more than 350 miles between stops twice in 171 fill-ups. The problem is a warning light that illuminates prematurely and laser-beams into

▼ C/D TEST RESULTS

PERFORMANCE	NEW	40,000
ZERO TO 60 MPH	7.7 sec	8.0 sec
ZERO TO 100 MPH	22.7 sec	23.4 sec
ZERO TO 110 MPH	32.0 sec	29.0 sec
ROLLING START, 5-60 MPH	8.5 sec	8.5 sec
1/4-MILE	16.1 sec @ 87 mph	16.3 sec @ 86 mph
BRAKING, 70-0 MPH	181 ft	166 ft
ROADHOLDING, 300-FT-DIA SKIDPAD	0.78 g	0.82 g
TOP SPEED (GOVERNOR LIMITED)		118 mph
EPA FUEL ECONOMY, CITY/HWY		29/37 mpg
C/D-OBSERVED FUEL ECONOMY		34 mpg
UNSCHEDULED OIL ADDITIONS		0 qt

OPERATING COSTS (FOR 40,000 MILES)

SERVICE (3 SCHEDULED, 2 UNSCHEDULED)	\$376
NORMAL WEAR	\$0
REPAIR	\$0
GASOLINE (@ \$2.69 PER GALLON)	\$3165

DAMAGE AND DESTRUCTION

REPAIR CHIPPED WINDSHIELD	\$50
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LIFE EXPECTANCIES (ESTIMATED FROM 40,000-MILE TEST)

TIRES	50,000 miles
FRONT BRAKE PADS	75,000 miles
REAR BRAKE SHOES	more than 100,000 miles

WHAT BITS AND PIECES COST

HEADLAMP	\$396
ENGINE AIR FILTER	\$24
OIL FILTER	\$7
WHEEL	\$262
TIRE	\$150
WIPER BLADES (LEFT/RIGHT/REAR)	\$31/\$22/\$23
FRONT BRAKE PADS	\$63



077

RANTS AND RAVES

AARON ROBINSON

What’s with the tiny fuel tank? I just stopped with seven miles showing on remaining range, and it took all of 9.2 gallons.

TONY QUIROGA

Structure is much improved over the old Fit—it feels solid when you’re on the bump stops, which is all the time if anyone is onboard.

JEFF SABATINI

It is one of the few cars we get here that’s fun to drive at legal speeds. It is so slow you can actually exercise its athleticism.

DAVID BEARD

The clutch: I’ve felt more pressure from a burrito.

AARON ROBINSON

The low-fuel warning light comes on with three (3!) full gallons left in the tank. Or one-third of the whole tank. Or about 90 miles of driving. C’mon, Honda!

TONY SWAN

This is a driver’s car, and the sound of a robust little engine going about its business is part of the experience. Anyone who doesn’t like that should be driving a fridge.

ERIC TINGWALL

At 80 mph, driving the Fit sounds just like walking behind my 20-year-old Honda lawn mower.

CAROLYN PAVIA-RAUCHMAN

I’d take it for a commuter any day, but I’d leave it at home with the dogs when I go on vacation.

AARON ROBINSON

Fuel gauge showed zero. No lines. Range: Zero. Nothing. Nada. How much did it take? 8.6 gallons, meaning two gallons still in the tank! Sixty miles of driving. C’mon, Honda!

your eyes like a doomsday clock, impelling you to refill when there are still about three gallons of regular in the tank.

After posting a quick-for-a-Fit 16.1-second quarter-mile in initial testing, the 130-hp runabout wintered with our West Coast crew in Southern California. On the trip to and fro, our road warriors found little long-haul peace of mind, particularly on the western highways where heavy trucks carve pavement ruts and the Fit's narrow stance means it dances between the valleys. The sensation is one of torque steer at 70 mph.

It was also on this trip that we dabbled with one of the Fit's few creature comforts: HondaLink smartphone integration. It's intended to mirror select iPhone apps on the radio screen, but we found HondaLink finicky in operation and convoluted in setup. Aside from spending \$107 on cables, including HDMI and Apple Lightning wires and an adapter to marry the two, a user must load three applications on a smartphone to make HondaLink work. Worst of all, HondaLink locks out all other smartphone apps. So long, Waze. There is a Honda-spec navigation app, but it runs \$60 and we didn't see its value. It is worth mentioning that factory nav isn't available on the EX, and HondaLink is what you have to endure if you must have a manual transmission and in-dash naviga-

↓ Bunches of luggage and loads of carbon-based items, such as passengers and gasoline, fit into a little more than 13 feet of Fit.



tion. Apple and Android have since rolled out infotainment software that mirrors your smartphone, and both function better than Honda's beta version.

Not awaiting further development is Honda's trouble-free reputation, and the Fit lived up to it, mostly, with three scheduled and two unscheduled stops. At the initial service (\$72), at around 10,000 miles, the dealer performed two recalls. The first involved replacing the front bumper beam, and the second verified whether or not an airbag icon was displayed on some trim parts. The next service, around 20,000 miles, included some extra checks and cost \$149. During the third service, at 32,500 miles (\$155), the dealer resurfaced warped front brake rotors under warranty, a stop-gap repair in most cases. The dealer also replaced cabin- and engine-air filters. Honda's onboard computer determines each car's oil-service interval. Depending on the car's duty cycle, there may be one additional service in the first 40,000 miles, not called for in our case.

Brake pulsing caused by the warped rotors didn't reappear, but our Fit did fail to start one Friday afternoon. We jump-started the car with a battery booster [see "ChargeIt! Jump"], hoping the alternator would recharge it. But the problem persisted, and features editor Jeff Sabatini had to jump the Fit all weekend. Our local dealer replaced the battery under warranty the following Monday. The other unscheduled stop came when Honda informed us that our Fit was subject to a third recall. All four ignition coils were swapped to prevent stalling.

Final testing indicated that the Fit lost a step, or 0.2 second, in the quarter-mile, despite posting an identical 5-to-60-mph time of 8.5 seconds. The broken-in tires bumped skidpad grip to 0.82 g and cut braking distance down to 166 feet, improvements of 0.04 g and 15 feet. All in, including fuel (\$3165) and the cost to repair a chipped windshield (\$50), the Fit cost us \$3591 over 40,000 miles, making it the most-affordable-to-run long-term we've had since gas prices spiked roughly 10 years ago.

Frugality is the least sexy of concerns, and the Fit excelled at it. But it wasn't the paramour we wanted to take home on Friday afternoons. Call us overprivileged, but there's more to life than abundant cargo space and high gas mileage. ■

★ FLEET FILES



▲ 2015 SUBARU WRX

37,591 MILES

25 OBSERVED MPG

Evaluate it by any metric other than horsepower-per-dollar and the WRX's powertrain comes up short, at least for a modern car. A lumpy power band and touchy throttle make the 268-hp flat-four lag and surge like the turbocharged engines of yore. We also paid \$300 to replace the slipping clutch under partial warranty at 24,500 miles. At least the chassis feels current. It's no GTI, but the fourth-generation WRX delivers nicely balanced handling, lively steering, and a modicum of civility in the ride—major improvements relative to its predecessor.



▲ 2016 FORD MUSTANG GT COUPE

2349 MILES

16 OBSERVED MPG

It may not be as exciting as the new Shelby GT350, but it's still a 2015 10Best winner, so we've gladly welcomed a blacked-out 2016 manual coupe and its 5.0-liter Coyote V-8 into our long-term fleet. Its \$41,290 as-tested price includes the Premium trim level, GT Performance package, and a pair of Recaro sport seats. Our initial track trip yielded a 4.3-second sprint to 60 mph and a 12.9 at 112 mph in the quarter-mile, along with 0.94 g of skidpad grip. Now we have to nurse it through a Michigan winter before we can fully exploit that performance.

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69115/69121/69129
69137/69249



Customer Rating
★★★★★

\$3.99

comp at \$9.38

68128103

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SUPER COUPON

SAVE \$660

44", 13 DRAWER INDUSTRIAL QUALITY ROLLER CABINET

US*GENERAL PRO

LOT 68784 shown
69387/62270/62744



• Weighs 245 lbs.

Customer Rating
★★★★★

\$369.99

comp at \$1029.99

68135415

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SUPER COUPON

WOW

130 PIECE TOOL KIT WITH CASE

PITTSBURGH

LOT 69331
68998 shown



Customer Rating
★★★★★

\$30

comp at \$72.88

68138472

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SUPER COUPON

SAVE \$349

2.5 HP, 21 GALLON 125 PSI VERTICAL AIR COMPRESSOR

CENTRAL PNEUMATIC

LOT 67847 shown
69091/61454
61693/62803



Customer Rating
★★★★★

\$149.87

comp at \$499

68143644

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SUPER COUPON

SAVE \$60

PITTSBURGH RAPID PUMP® 1.5 TON ALUMINUM RACING JACK

• 3-1/2 Pumps Lifts
Most Vehicles
• Weighs 32 lbs.

LOT 60569 shown
68053/69252/62160
62496/62516



Customer Rating
★★★★★

\$59.99

comp at \$119.99

68126122

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SUPER COUPON

SAVE 50%

PNEUMATIC ADJUSTABLE ROLLER SEAT

PITTSBURGH

• 300 lb. capacity

LOT 46319 shown
61160/61896



Customer Rating
★★★★★

\$27.99

comp at \$39.99

68129438

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SUPER COUPON

SAVE 59%

4-1/2" ANGLE GRINDER

drillmaster

LOT 69645/95578
60625 shown



Customer Rating
★★★★★

\$11.99

comp at \$29.97

68136103

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SUPER COUPON

SAVE 56%

MOVER'S DOLLY

HaulMaster

LOT 61899
60497/62399
93888 shown



• 1000 lb. capacity

Customer Rating
★★★★★

\$87.60

comp at \$19.97

68143532

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SUPER COUPON

SAVE \$68

900 PEAK/ 700 RUNNING WATTS 2 HP (63 CC) 2 CYCLE GAS RECREATIONAL GENERATOR

NEW

LOT 66619/60338
69381 shown



Customer Rating
★★★★★

\$99.99

comp at \$168.97

68080849

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SUPER COUPON

SAVE \$210

20 TON SHOP PRESS

CENTRAL MACHINERY

• Pair of arbor
plates included

LOT 32879
60603 shown



Customer Rating
★★★★★

\$159.99

comp at \$369.99

68102436

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SUPER COUPON

SAVE \$200

VEHICLE POSITIONING WHEEL DOLLY

PITTSBURGH

LOT 62234/67287
61917 shown



• 1250 lb. capacity

Customer Rating
★★★★★

\$69.99

comp at \$269.99

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TESLA MODEL S P90D / MERCEDES C-CLASS COUPE / 2017 INFINITI Q30 / BMW 340i / NISSAN TITAN XD / KIA OPTIMA LX 1.6T / AUDI A3 e-tron



• HATCHBACK

FERRARI F12tdf

The return of the short-wheelbase Ferrari. Only this time, it's virtual. *by Eric Tingwall*

To build its latest red-blooded track special, Ferrari set out to ruin a perfectly good car. In transforming the sure-footed F12 grand tourer into the fast-and-loose, apex-hounding F12tdf (Tour de France), Ferrari engineers deconstructed the stability that's inherent in the F12's long wheelbase, in its substantial weight, and in its high polar moment of inertia relative to mid-engined cars.

The front tire tread fattens from 255 millimeters to 285; an aggressive suspension alignment boosts turn-in and lateral grip; and, with no change to the rear-tire width, a fickle, oversteering monster is

born. One Ferrari chassis engineer describes the team's work bluntly: "First, we screwed up the car."

With the chassis suitably squirrely, engineers applied the brand's first use of rear-wheel steering to dial in just enough stability to make the car manageable and predictable. Ferrari calls the resulting package "Passo Corto Virtuale," or virtual short wheelbase, and it "shrinks" the F12tdf's 107.1-inch wheelbase and 3600-pound curb weight to give it more Mazda Miata-like behaviors. Okay, maybe the F12tdf doesn't drive quite that nimbly, but it more than compensates with the

uncanny precision that \$490,000 buys.

The F12tdf worms its way into your psyche with delicate, light steering that is direct, immediate, and unforgiving. Spin the wheel too fast or too far and the rear responds in turn, rotating to the same extent. Get it right, though, and the car darts where you look, with the rear tires faithfully following the fronts in a tight, tidy arc. It's ironic that the steering feels so special, as the engine, transmission, suspension, brakes, and aerodynamics were all massaged but the hydraulically assisted steering system was unchanged.

The electric motors that steer the rear wheels at up to two degrees in either direction come from ZF, with Ferrari performing the software calibration to ensure that the system works in harmony with the electronically controlled limited-slip differential, the magnetorheological shocks, the traction control, and

▼ SPECIFICATIONS

VEHICLE TYPE: front-engine, rear-wheel-drive, 2-passenger, 2-door hatchback
BASE PRICE (est) \$490,000
ENGINE TYPE: DOHC 48-valve V-12, aluminum block and heads, direct fuel injection
DISPLACEMENT 382 cu in, 6262 cc
POWER 769 hp @ 8500 rpm
TORQUE 520 lb-ft @ 6750 rpm
TRANSMISSION: 7-speed dual-clutch automatic with manual shifting mode
DIMENSIONS
WHEELBASE 107.1 in
LENGTH 183.3 in
WIDTH 77.2 in
HEIGHT 50.1 in
CURB WEIGHT 3600 lb
PERFORMANCE (C/D EST)
ZERO TO 60 MPH 2.8 sec
ZERO TO 100 MPH 6.8 sec
1/4-MILE 10.8 sec
TOP SPEED 215 mph
FUEL ECONOMY (C/D EST)
EPA CITY/HWY 11-12/16 mpg

the stability control. As you click the steering-wheel-mounted *manettino* dial from sport mode to race to traction control off, the car's agility swells. Neutral is the wrong word, though. By the standards of modern production cars, this Ferrari is loose. The F12tdf's front tires only plow when you do something truly stupid.

Modern rear-wheel-steering systems, including those in the big-dog Porsche 911s that also come from ZF, typically countersteer relative to the front wheels at low speeds to improve agility, and steer in the same direction at elevated velocities for the sake of stability. Ferrari claims its adaptation doesn't need to countersteer; the natural behavior of the car is sufficiently agile. Instead, only the enhanced stability of pointing the rear wheels in the same direction as the fronts keeps the tail from overtaking the nose.

The F12tdf is far less forgiving than Ferrari's previous track special, the aptly named 458 Speciale. That mid-engined car's reactions flatter you into believing your every move is a flawless application of vehicle-dynamics theory. The F12tdf demands more focus, more skill, and more respect. In return, it delivers honest fun that is both uncommon and uncanny in a car with this much power and a football field's worth of Pirelli P Zero Corsa.

Think of it as a testament to just how intoxicating the chassis is that it's taken us so many words to get to the 6.3-liter V-12, because the drama of unleashing all 769 horsepower is man's noblest tribute to the internal-combustion engine. At full throttle, it bellows like heaven's own brass section ushering you into a meeting with the Big Car Guy Upstairs, the revs winding up with the frenzy of a natural disaster.

The F12tdf musters an additional 39



↑ Too much enthusiasm with the steering wheel will make the tail-happy F12tdf spin. The upside is that there are no carpets to stain.

horsepower and 11 pound-feet of torque over the standard F12 with the help of new air-filter boxes, revised intake plumbing, and larger throttle bodies. Solid lifters replace hydraulic tappets, and the resulting weight reduction allows Ferrari to add more valve lift to the intake-cam profile and raise the rev limiter 200 rpm to 8900. Variable-length intake runners use telescoping trumpets within the intake plenum to shrink or stretch the runner length for optimized airflow. In the F12tdf, Ferrari uses just two lengths, but future cars may vary trumpet position continuously.

Shorter gear ratios in the seven-speed dual-clutch transaxle are complemented by quicker shift times. We project a 2.8-second dart to 60 mph on the way to a 10.8-second assault on the quarter-mile. The always-on nature of the big-displacement, naturally aspirated 12-cylinder engine demands a delicate right foot on corner exit, but the pedal obliges with long, linear travel. A brake pedal with just as much fidelity activates a carbon-ceramic braking system borrowed from the LaFerrari.

Ferrari intends for owners to drive the F12tdf to the track, at the track, and back home from the track. But even with its dampers set at their most compliant, the F12tdf skims over humps in the road like a skipped rock. In city driving, the F1 dual-clutch automatic isn't as velvety as Porsche's or McLaren's gearboxes, par-



ticularly in off-throttle downshifts. Overall, though, the F12tdf remains a civilized road car. While lighter Alcantara suede replaces leather and the carpets have been removed altogether, Ferrari still fits a radio, navigation, and air conditioning.

Ferrari stripped a total of 243 pounds from the F12, a sizable chunk coming from reducing the amount of glass by tapering the backlight and shrinking the rear quarter-windows until the transparent section is no larger than an iPhone. Carbon fiber replaces aluminum for the inner and outer door panels, plus the front and rear fascias. And while the rest of the body parts are still aluminum, the roof and the A-pillars are the only pieces that carry over from the F12. A multitude of dive planes and spats increase downforce to more than 500 pounds at 124 mph, according to Ferrari. It's not a beautiful car, but the cooling and aerodynamic changes create a visually striking one. The righteous louvered fenders bulging around the rear tires are both an homage to classic Ferraris and a carnal suggestion of the car's capabilities. Ferrari may have taken one step backward to start work on the F12tdf, but the finished product is miles ahead of the F12 when it comes to driving excitement.



TESLA MODEL S P90D

TESTED The first sub-3.0-second sedan, as well as the first sub-3.0-second sedan. Acceleration tapers off shortly after euphoria sets in. *by Don Sherman*

Tesla's product architect, Elon Musk, must have been watching a Mel Brooks marathon on TNT when he picked "Ludicrous Speed," straight out of *Spaceballs*, as the tag for the fastest acceleration mode in his Model S P90D. And indeed, one must have balls from outer space to fully exploit this car's launch performance. To sort heroic acts from hype, we ran this electric missile through our test gantlet with, shall we say, shocking results.

Cutting to the chase, it's the first production car with four doors to crack the 3.0-second zero-to-60-mph barrier, doing it in 2.8 seconds. In 30-to-50-mph passing acceleration, it trumps the Tesla Roadster Sport's all-time record run of 1.5 seconds, also by two-tenths of a second. The P90D's 11.1-second, 121-mph quarter-mile run, achieved with no hint

of tire smoke or exhaust ruckus, merits VIP parking at NHRA headquarters. The Model S P85D in Insane mode, formerly the quickest Tesla, was a half-second slower to 60 and 0.7 second and 7 mph pokier in the quarter-mile.

Due care is necessary to achieve these results. Options that add ballast, including the Model S's huge sunroof, rear-facing seats, and second battery charger, must be

avoided. It's a \$38,000 upgrade from a base Model S70 rear-drive version to obtain the most-potent electric motors, the four-wheel drive, and the long-range 90-kWh battery pack. Then add the \$10,000 Ludicrous Speed option to enable the on-demand disappearing services. A full cardiac work-up is recommended for anyone interested in experiencing Tesla's latest abuse of common sense.

GOLLY G's

Checking our data bank for outliers, we found this Tesla ranks fourth among five cars capable of averaging more than 1.0 g during the first second of acceleration:

Porsche 911 Turbo S	1.25
Lamborghini Huracán LP610-4	1.19
Porsche 918 Spyder	1.14
Tesla Model S P90D	1.12
Audi R8 V-10 Plus	1.08

And we'd add an honorable mention for the Bugatti Veyron 16.4 at 0.95 g.

Maximum acceleration is available only when the battery's state of charge is above 95 percent and "max battery performance mode" is set on the control screen. When we test, we average two acceleration runs in opposite directions to eliminate wind and grade effects. Normally that's no issue, but because the Model S's performance deteriorates with heat build-up in the battery pack, control-

SPECIFICATIONS

VEHICLE TYPE: front- and rear-motor, 4-wheel-drive, 5-passenger, 4-door hatchback
PRICE AS TESTED \$134,200
BASE PRICE \$119,200
MOTOR TYPE: 2 asynchronous AC
POWER **F:** 259 hp **R:** 503 hp
Combined: 532 hp
TORQUE **F:** 244 lb-ft **R:** 469 lb-ft
Combined: 713 lb-ft
TRANSMISSION: 1-speed direct drive
DIMENSIONS
WHEELBASE 116.5 in
LENGTH 196.0 in
WIDTH 77.3 in
HEIGHT 56.5 in
PASSENGER VOLUME 95 cu ft
CARGO VOLUME 32 cu ft
CURB WEIGHT 4842 lb

C/D TEST RESULTS

ZERO TO 60 MPH **2.8 sec**
ZERO TO 100 MPH 7.1 sec
ZERO TO 150 MPH 21.8 sec
ROLLING START, 5-60 MPH 3.0 sec
TOP GEAR, 30-50 MPH 1.3 sec
TOP GEAR, 50-70 MPH 1.8 sec
1/4-MILE **11.1 sec @ 121 mph**
TOP SPEED (governor limited) 155 mph
BRAKING, 70-0 MPH 159 ft
ROADHOLDING, 300-FT-DIA SKIDPAD 0.90 g
FUEL ECONOMY
EPA CITY/HWY 89/98 MPGe
C/D OBSERVED **66 MPGe**

TEST NOTES:

Reaping the optimum acceleration reported here required minor adjustments to our usual procedures (noted in text).



lers, wiring, and electric motors, pausing at least three minutes between acceleration runs is necessary.

This Tesla's exploitation of Newtonian physics tops anything you're likely to encounter this side of an amusement park or the Navy's flight school. Nailing the right pedal vents a massive torque gush, and weird, wonderful, and addictive bursts of dopamine flood your brain's pleasure center when this tsunami sloshes the juice in your inner ear.

That's the beauty of chambering 713 pound-feet of torque into a four-wheel-driver weighing 4842 pounds. Sir Isaac didn't lie when he told you great things are possible without bending or bruising his second law of motion. You hope the rush lasts to orbital escape velocity

but, alas, it soon peters out. Roll alongside a Dodge Charger SRT Hellcat at 40 mph, for example, and the Mopar beats the Tesla to 150 mph by more than six seconds.

An interesting consolation race would be to see whether the Hellcat or the P90D would be the first to deplete its fuel supply. For now, we are satisfied in the knowledge that this is the quickest production four-door ever conceived.



▼ SPECIFICATIONS

VEHICLE TYPE:	front-engine, rear- or 4-wheel-drive, 4-passenger, 2-door coupe
BASE PRICE (est)	\$42,000-\$73,000
ENGINES:	turbocharged and intercooled DOHC 16-valve 2.0-liter inline-4, 241 hp, 273 lb-ft; twin-turbocharged and intercooled DOHC 32-valve 4.0-liter V-8, 469 or 503 hp, 479 or 516 lb-ft
TRANSMISSION:	7-speed automatic with manual shifting mode
DIMENSIONS	
WHEELBASE	111.8 in
LENGTH	184.5-187.0 in
WIDTH	71.3-73.9 in
HEIGHT	55.1-55.3 in
CARGO VOLUME	13-14 cu ft
CURB WEIGHT	3600-3800 lb
PERFORMANCE (C/D EST)	
ZERO TO 60 MPH	3.7-6.1 sec
ZERO TO 100 MPH	9.0-16.0 sec
1/4-MILE	12.1-14.6 sec
TOP SPEED	155-180 mph
FUEL ECONOMY (C/D EST)	
EPA CITY/HWY	18-25/25-34 mpg

MERCEDES-BENZ C-CLASS COUPE

This sports coupe is too slow. That two-door just wants to roast its tires. *by Eric Tingwall*

Academically, Goldilocks is a garbage fable. The entitled snot, who becomes an unrepentant criminal over a bowl of oatmeal and a nap, suffers precisely zero consequences for her actions, and the classic tale makes no attempt at a teachable moment. The only takeaway appears to be that, in life, sometimes our options are either too hot or too cold, when all we really want is something in the middle—something just right. That's about as philosophical as a car review can be.

In Mercedes-Benz's C300 coupe, a 2.0-liter turbocharged four-cylinder pairs with either rear- or four-wheel drive for a sedate experience more akin to that of a luxury sedan than a sports coupe, which the company claims the C300 is. The car

↓ The C300 coupe is a little too cold. The C63 coupe might be too hot. A (thus-far nonexistent) C450 coupe would be just right.

rides nicely and handles respectably, but the engine has the energy of a hibernating bear and the car feels slower than its rated 241 horsepower and 273 pound-feet of torque. We expect the C300 coupe, like its four-door sibling, to be a few tenths behind its quickest competition, with a zero-to-60-mph time just over six seconds.

Among its peers, the 503-hp Mercedes-AMG C63 S is the biggest bruiser, with a 78-hp advantage over the BMW M4 and a 39-hp edge on the Cadillac ATS-V. The non-S C63, at 469 horsepower, isn't cooler so much as it is marginally less scalding.

AMG eagerly points out that the C63 coupe is not just a C63 sedan with two fewer doors. It has a shorter final-drive ratio than the sedan for quicker acceleration. There's also a new rear suspension. In pursuit of a more rigid assembly, AMG rearranged the coupe's upper links, replaced several bushings with ball joints, and widened the rear track by 1.8 inches compared with the sedan.

Even with the extra rear-end grip of the widened track, the C63 S coupe's front tires bite quick and hard on fresh rubber. The steering is hefty and accurate, though largely unfeeling. As the Michelin Pilot Super Sports heat up, however, the C63 becomes a 3800-pound pendulum, scrubbing the

front tires in one corner and then swinging the ass wide in the next. The BMW and the Cadillac are more at home on the track, although the rear-wheel-drive AMG still makes drifting as easy as tapping your right toe.

Both the C300 and AMG C63 coupes deliver a beautifully designed cabin filled with rich leather, large swaths of wood, carbon-fiber or aluminum trim, and tactile switchgear. Unfortunately, that's all tainted by Mercedes' COMAND infotainment system, which requires cryptic combinations of nudges, presses, and turns of the click wheel to navigate the menus.

Mercedes will offer eight different engine choices for the C-class coupe in Europe, and yet the company won't divulge what will fill the yawning gap in price and performance between the circa-\$42,000 C300 and the \$73,000 AMG C63 in the U.S. At the very least, a C450 AMG Sport seems necessary and inevitable. If the C450 AMG Sport sedan is any indication, a two-door with the same 362-hp powertrain and similar chassis setup is the C coupe that Goldilocks would pinch, run dry, and abandon in a seedy neighborhood. It's not too ostentatious nor too slow, it's just quick and luxurious enough, and it's priced smartly. Based on our short time with C300 and AMG C63 coupes, the car that slots between them should be just right.



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2017 INFINITI Q30 SPORT AWD

Meet the better Benz, whatever it may be badged.

by Alexander Stoklosa

The Irish wit Oscar Wilde once postulated: “Deceiving others. That is what the world calls a romance.” While Oscar faced his own obstacles with deception and Victorian-era romantic restrictions, Infiniti is making a better go of it with the 2017 Q30. For if to deceive is to romance, then the lyin’ Q30 is a four-wheeled lothario.

Two deceptions right off the bat: First, the Q30 resembles a crossover, which it is not. Also, it’s an Infiniti, which it isn’t either, exactly. At heart, it’s a rebadged Mercedes-Benz GLA, but to varying degrees and to good effect, Infiniti has put a lot of work into differentiating its potato-shaped thing from Benz’s potato-shaped thing, meaning the narrative heard ‘round the internet, that this is just a Mercedes knockoff, is not wholly accurate. The Q30 is its own odd animal, and therein lies some of its appeal.

The tall hatchback body and 7.5 inches of ground clearance imply a crossover, but the Q30 will be only front-wheel drive in the U.S. Four-wheel drive is restricted to European models—the Q30 we drove was so equipped—but will be standard on the QX30, a Q30 “crossover” version with more body cladding and ground clearance.

Next to the sun’s surface and Miranda Kerr, few things at this very second are quite as hot as compact luxury crossovers, and Infiniti is late to the party. But the Q30’s design is alluring, with sharp creases, powerful curves, and muscular proportions.

Leveraging parent company Renault-Nissan’s technical partnership with Daimler, Infiniti plucks from the GLA the Q30’s most significant components, namely its turbo four-cylinder, seven-speed dual-clutch transmission, suspension hardware, and 106.3-inch wheelbase. Infiniti

▼ SPECIFICATIONS

VEHICLE TYPE: front-engine, four-wheel-drive, 5-passenger, 4-door hatchback

BASE PRICE (est) \$32,000

ENGINE TYPE: turbocharged and intercooled DOHC 16-valve inline-4, aluminum block and head, direct fuel injection

DISPLACEMENT 121 cu in, 1991 cc

POWER 208 hp @ 5500 rpm

TORQUE 258 lb-ft @ 1200 rpm

TRANSMISSION: 7-speed dual-clutch automatic with manual shifting mode

DIMENSIONS

WHEELBASE 106.3 in

LENGTH 174.2 in

WIDTH 71.1 in

HEIGHT 58.1-58.9 in

TRUNK VOLUME 13 cu ft

CURB WEIGHT 3400 lb

PERFORMANCE (C/D EST)

ZERO TO 60 MPH 6.4 sec

ZERO TO 100 MPH 17.8 sec

1/4-MILE 15.1 sec

TOP SPEED 146 mph

FUEL ECONOMY (C/D EST)

EPA CITY/HWY 24/32 mpg

didn’t make much effort to hide the car’s roots in press presentations, but the brand applies its own tune to the springs, shocks, bushings, throttle response, shift mapping, and electrically assisted steering.

The interior is unfiltered Infiniti, pleasantly richer than the GLA’s decidedly entry-level innards but just as tight for four adults. The window switches, steering-wheel buttons, door-mounted power-seat controls, and the steering-column stalks stand out as the only visible Benz components. Infiniti’s own seven-inch touch screen crowns the center stack.

↓ They share the same DNA (engine, suspension, transmission), but the Q30 got the handsome gene the Mercedes GLA missed.





Chief vehicle engineer Grahame Cornforth describes the screen's integration with Mercedes' proprietary electronics platform as having been a colossal undertaking. We'd describe it as worthwhile, especially the work that went into making sure the diagnostic equipment at Infiniti's dealerships can play doctor with the Q30's German electronics.

Infiniti will offer three Q30 variants. The first two, base and Premium, will prioritize comfort and luxury. We sampled the third, dubbed Sport, which is lowered by 0.6 inch and rides on 7-percent-stiffer springs. Even slouching slightly, the Sport still rises to near-crossover height, its roof just 1.9 inches shy of a GLA250's. Weighing around 3400 pounds, this European-market four-wheel-drive Q30 Sport doesn't promise huge speed, especially with its 208-hp Mercedes engine. Even so, it darted smartly in and out of traffic around our Lisbon, Portugal, drive venue.

More memorable is what fine dance partners the turbocharged engine and the dual-clutch automatic make. Mercedes tunes these same mechanical components to be lazy. The long-travel throttle pedal in the GLA requires sharp prods to wake up the pistons, and the slurred gearchanges

fall well short of delivering on the transmission's promise of quick shifts. In the Infiniti, even the slightest throttle inputs exact linear and strident responses, and shifts are crisp and smooth. Leaps from stationary lanes to gaps in an adjacent artery are lag-free and confident, the only hitch being the blind spots created by the big rear pillars.

Tracing Portugal's coast away from the city, the roads become narrow, twisting, undulating, and broken. Here the Q30 couldn't hide its firm suspension, although distinct shock valving mitigates the crashing sensations we've felt in the just-as-tightly-sprung Mercedes. Even on roads that don't produce repeated trips to the bump stops, there is plenty of sharp vertical motion over the sorts of surfaces most Americans traverse daily, no doubt aggravated by the Sport model's 19-inch wheels.

Infiniti wraps those rims in run-flat summer tires, and the impression of relatively strong grip is mostly attributable to this V-rated rubber and the uncommon mixture of high seating and a flat cornering attitude. Helping keep the body level are rebound springs in the dampers, which work against the inside wheels' inclination to droop on turn-in. The dynamic high-

lights end there, however. Cranked 5 or 35 degrees, at more or less any speed, the electrically boosted steering has weighting that remains robotically constant through a turn, and there is no feedback.

The handling errs toward understeer, the lifeless steering but nicely firm brakes merely tools with which to adjust its severity in fast driving. The four-wheel drive is pitched as an all-weather traction device that prioritizes the front axle most of the time—and not as something to encourage sideways Scandinavian flicks. Mimicking a crossover when parked, the Q30 does a mighty convincing impression of one when in motion, too. Perhaps the front-drive Q30, lighter by 150 pounds, will have more spark. But it's clear from talking to Infiniti that it expects the QX30 to outsell the Q30 in the U.S. Both 30s go on sale here later this year.

The non-Sports' more comfortable suspension setup, we predict, will be the go-to trim. We'd also say buyers want four-wheel drive, but the frequency with which we spot Ford Escapes in Michigan with empty rear-differential carriers implies that four driven wheels matter less than the appearance of four driven wheels.

As with most not-quite-cars/not-quite-trucks, serious drivers may want something more focused. For everyone else, the Q30's coy charade as neither a Benz nor a crossover works to give Infiniti showrooms something different, something with a little, um, romance.

BMW 340i

TESTED Silky new inline-six, greater composure, newly available Track package. Steering is still aloof, computer-assisted manual shifting. *by Mike Sutton*

Here's how we see it: BMW tempered the driving character of the current 3-series in its quest for a broader audience. We've been vocal about this, and BMW has been listening. But maybe not closely enough. While a host of updates address some of our gripes and improve the car's performance, the 3's previously sublime tactility—that unquantifiable element that made these cars so engaging—remains muffled in this sixth-generation car.

The most obvious change for 2016 applies to the six-cylinder models, which are now badged 340i and feature BMW's new B58 3.0-liter turbocharged inline-six. Along with producing 320 horsepower and 332 pound-feet of torque—increases of 20 and 32, respectively, over the previous N55 unit—the new engine emits a sonorous exhaust note reminiscent of BMW's naturally aspirated mills.

Paired with a six-speed manual, the B58 engine shaved a few tenths off the zero-to-60-mph time of the last manual 335i we tested, returning a 4.8-second dash.

→ Despite some new trim, the 3-series' interior has been well and truly surpassed by newer offerings from Audi and Mercedes.

The refinements to the F30's chassis are more modest and include stiffer front struts, retuned rear dampers, and new programming for the electrically assisted steering. The results are incremental: The ride is slightly more composed, and improved body control makes for flatter, steadier cornering.

Our test car also featured the 3's newly available Track Handling package, which for \$1700 adds BMW's Variable Sport Steering, Adaptive M suspension, and M Sport brakes, as well as darkened 18-inch wheels wrapped with Michelin Pilot Super Sport summer tires. Overall grip is strong, maxing out at 0.91 g on the skidpad, and stops from 70 mph take just 159 feet.

Yet, despite the tweaks to the steering software, the updates do little to improve the feedback at the 3's helm. The steering still lacks the positive on-center feel we

▼ SPECIFICATIONS

VEHICLE TYPE: front-engine, rear-wheel-drive, 5-passenger, 4-door sedan
PRICE AS TESTED \$58,420
BASE PRICE \$46,795
ENGINE TYPE: turbocharged and intercooled DOHC 24-valve inline-6, aluminum block and head, direct fuel injection
DISPLACEMENT 183 cu in, 2998 cc
POWER 320 hp @ 6500 rpm
TORQUE 332 lb-ft @ 1380 rpm
TRANSMISSION: 6-speed manual
DIMENSIONS
WHEELBASE 110.6 in
LENGTH 182.8 in
WIDTH 71.3 in
HEIGHT 56.3 in
PASSENGER VOLUME 94 cu ft
TRUNK VOLUME 17 cu ft
CURB WEIGHT 3686 lb

▼ C/D TEST RESULTS

ZERO TO 60 MPH 4.8 sec
ZERO TO 100 MPH 11.6 sec
ZERO TO 150 MPH 29.8 sec
ROLLING START, 5-60 MPH 5.9 sec
1/4-MILE 13.3 sec @ 106 mph
TOP SPEED (governor limited) 155 mph
BRAKING, 70-0 MPH 159 ft
ROADHOLDING, 300-FT-DIA SKIDPAD 0.91 g
FUEL ECONOMY
EPA CITY/HWY 20/30 mpg
C/D OBSERVED 19 mpg

TEST NOTES: The braking, acceleration, and skidpad figures are improvements over the 335i's, but moderate understeer at the limit still leaves something to be desired.



want in a driver's car—it's video-game artificial for the first couple of degrees of input—and there's only a small increase in effort as cornering loads rise. Further

interfering with the 3's fun factor is the manual transmission's new standard automatic rev-matching feature, which works well but, frustratingly, can only be turned off by fully deactivating the stability-control system.

The rest of the changes, including subtle fascia and lighting touches and various new trim pieces throughout the cabin, require a keen eye to spot. While prices increase marginally on four-cylinder models, the 340i costs about two grand more than the 2015 335i, at \$46,795 to start. And with the Track Handling hardware and several other optional packages, our test car's sticker quickly ballooned to \$58,420.

The new 3-series' mid-cycle updates make a good car a little better, but they're not transformative. This generation of 3-series still lacks the rewarding sense of driver involvement that helped earn its predecessors 23 10Best trophies since 1992. Knowing its record, we can't help but miss its defining characteristic.



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NISSAN TITAN XD PLATINUM RESERVE

TESTED ☒ Smooth, quiet torque, easygoing chassis tuned for stable towing. ☐ Overwhelming flab, no ambition to be great. *by John Pearley Huffman*

Surprisingly, the Nissan Titan has been in constant production since the 2004 model year. It's the pickup market's back marker; the 12,527 Titans sold in 2014 about equal how many F-series Fords produces every five days. No one thinks about it, no one talks about it, and few outside of its Canton, Mississippi, assembly plant would have missed the Titan if Nissan had humanely euthanized it.

But it lives. After nearly becoming a rebadged Ram in a Nissan-Chrysler joint venture that fell apart in 2009, a new, 2016 Titan is here to pursue the big-truck

zeitgeist. Actually, it's sort of two trucks. First, there's the regular Titan that, to oversimplify the matter somewhat, is the new Titan body atop the old Titan frame. Then there's this, the Titan XD, which has mostly new bits underneath and its own beefier ladder frame. According to Nissan, the XD slyly slots between half- and three-quarter-ton pickups.

"We've been able, with the Titan XD, to position the spring rates lower than what a three-quarter-ton truck would

→ This Cummins turbo-diesel V-8 stakes out the middle ground in size and output. Below: Nissan has used up all the chrome.

▼ SPECIFICATIONS

VEHICLE TYPE: front-engine, rear/4-wheel-drive, 5-passenger, 4-door pickup
PRICE AS TESTED (est) \$60,000
BASE PRICE (est) \$60,000
ENGINE TYPE: turbocharged and intercooled DOHC 32-valve diesel V-8, iron block and aluminum heads, direct fuel injection
DISPLACEMENT 305 cu in, 4997 cc
POWER 310 hp @ 3200 rpm
TORQUE 555 lb-ft @ 1600 rpm
TRANSMISSION: 6-speed automatic with manual shifting mode
DIMENSIONS
WHEELBASE 151.6 in
LENGTH 242.8 in
WIDTH 80.7 in
HEIGHT 78.7 in
PASSENGER VOLUME 120 cu ft
CURB WEIGHT 7360 lb

▼ C/D TEST RESULTS

ZERO TO 60 MPH 9.2 sec
ZERO TO 100 MPH 28.2 sec
ROLLING START, 5-60 MPH 10.1 sec
1/4-MILE 17.0 sec @ 82 mph
TOP SPEED (governor limited) 106 mph
BRAKING, 70-0 MPH 192 ft
ROADHOLDING, 300-FT-DIA SKIDPAD 0.74 g
FUEL ECONOMY
EPA CITY/HWY N/A
C/D OBSERVED 15 mpg

TEST NOTES: Brake-torque method helps cut turbo lag, improving acceleration. Some opposite lock is needed when cornering above the adhesion limit.

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be,” explains Nissan’s Titan product planning titan, Richard Miller. “We’ve been able to offer a softer, more compliant ride while still offering 12,000 pounds or more of towing. And because of the softer springs, we’ve used hydraulic cab mounts, which take out what we call ‘smooth road shake.’ Much better than rubber cab mounts.”

So, call it a five-eighth-ton truck. But it’s otherwise familiar. It has a control-arm front suspension with coil springs, the tail rides atop leaf springs, and the steering is recirculating-ball. Conventional stuff.

Eventually available in three cab configurations and two wheelbases, the Titan XD initially will be sold as a gargantuan Crew Cab with a long bed stretching

242.8 inches over a 151.6-inch wheelbase. That’s a 5.2-inch-shorter wheelbase than the longest Ford F-150 SuperCrew, though the Nissan’s longer overhangs mean that its overall length is only 0.9 inch less. And like other big pickups, the Titan XD emphasizes its massiveness with a nose so tall that grown-ups must stand on tiptoe to peer over the fenders into the engine bay.

In there, Nissan beckons Cummins cultists with an engine not offered in any Ram: a new 5.0-liter, turbo-diesel V-8. It rates at 310 horsepower and 555 pound-feet of peak torque at 1600 rpm. That falls between the Ram 1500’s VM Motori-made 3.0-liter EcoDiesel turbo V-6, at 240 horsepower and 420 pound-feet, and the Ram 2500’s 6.7-liter Cummins turbo-diesel six, at 350 horsepower and 660 pound-feet. And Nissan’s diesel produces much less power than the big turbo-diesel V-8s in the heavy-duty trucks from Ford and General Motors, which produce 440 horsepower and 860 pound-feet and 397 horsepower and 765 pound-feet, respectively. Nissan will eventually offer an updated version of the old 5.6-liter gas-burning V-8 in the new XD.

Our preproduction 4x4 test truck lacks running boards, but is otherwise resplendent in Platinum Reserve trim. Nissan coyly says Titan XD diesel pricing will start around \$40,000 and top out, like this truck, around \$60,000.

Naturally the Titan XD Platinum Reserve includes every tech toy and is decked out in more wood and leather than a Ruth’s Chris Steak House. The seats are comfortable with excellent back support, every control mostly logical and conventional, and thick insulation in the interior

↑ Platinum Reserve sounds like a fancy version of Michelob beer, but it is actually the XD’s leather-and-doodad-heavy trim.

and the engine bay means that the idling Cummins V-8 is barely heard.

Riding on 20-inch wheels and 265-section General Grabber HTS tires, the Titan XD has slow steering and a cushy ride. The Aisin six-speed automatic’s shifts are gentle and confident, even while towing a 2000 Toyota Tundra on a trailer behind it. And the XD is utterly stable. Considering its heft, it ought to be.

The unladen Titan XD needs 9.2 seconds to reach 60 mph and 17.0 seconds to complete the quarter-mile while moseying at 82 mph. That’s a little behind the crew-cab Ram EcoDiesel, which hits 60 mph in 9.0 seconds flat and runs the quarter-mile in 16.9 seconds. But that 5688-pound Ram seems feathery compared with the stupendously heavy, 7360-pound Titan XD. That’s three and a half tons plus three jockeys.

Mass limits the Titan XD to a 0.74-g skidpad orbit while the 70-to-zero braking distance is a mediocre 192 feet. The XD returned 15 mpg while we drove it—though that doesn’t factor in mileage while towing.

Nissan has added some sweet cargo-handling features to the Titan XD’s bed, with adjustable rail cleats for tie-downs and low-mounted LED lighting. Nice, but hardly paradigm-shattering.

Is there a place in the market for a diesel-powered, full-size pickup with less performance than heavy-duty competitors offer but with a nearly heavy-duty amount of avoiddupois? Nissan is about to find out. Of course, Nissan has virtually nothing to lose with this truck, either.

KIA OPTIMA LX 1.6T

TESTED  Economical in every sense, adept seven-speed dual-clutch automatic, newfound chassis composure.

 Acres of black plastic inside; 1.6 turbo comes only in one, low-spec trim level. *by Joe Lorio*

When it made its debut at the New York auto show in 2010, the now-outgoing Kia Optima wowed spectators with its attenuated roofline and determined visage. That Optima established Kia's current design language, and the new, 2016 version doesn't stray far from the script, with the tiger-nose grille, the arc of chrome along the roof edge, and the beltline that sweeps up at the rear. Details may have changed, and the car is 1.1 inches wider and a bit longer, but no one will confuse the new car with anything but an Optima.

Two of the three engines carry over: a 185-hp 2.4-liter four in the base and mid-level models and a 245-hp 2.0-liter turbo at the top, both with a six-speed automatic. The newcomer is a 178-hp 1.6-liter turbo with a seven-speed dual-clutch automatic. Available only in the LX 1.6T, it's the fuel-economy play (besides the Optima hybrid, still based on the previous-gen car).

The seven-speed dual-clutch is a welcome break from the rising tide of CVTs in this category. It credibly mimics the smoothness of a torque-converter automatic at low speeds and delivers well-timed shifts under acceleration. That

acceleration is pretty spry for a green guy, aided by the fact that the Optima LX 1.6T danced across our scales at 3241 pounds—more than 300 pounds less than the 2.0-liter SX. That figure is about on par with a four-cylinder Honda Accord.

With EPA city/highway figures of 28/39 mpg, and a 7.3-second zero-to-60-mph time, the 1.6-liter is the best of the three Optima powertrains. The 2.0-liter turbo gets to 60 only half a second quicker, while the 2.4-liter four (which we tested in the Optima's close kin, the Hyundai Sonata) is neither as quick nor as fuel efficient.

The LX 1.6T rides on the Optima's standard suspension, not the "sport-tuned" version found in the SX and SXL; even so, it need not make any apologies for its ride. Pleasantly tied down without excessive body motions, it's also compliant enough to take the edge off harsh pavement, aided by this version's 65-series rubber on 16-inch wheels. The low-rolling-resistance tires, however, led to a long stopping distance of 185 feet from 70 mph.

 *The Optima LX 1.6T is quicker and more fuel efficient than the base car, and it's still nicely priced. A sensible person's fuel sipper.*

▼ SPECIFICATIONS

VEHICLE TYPE: front-engine, front-wheel-drive, 5-passenger, 4-door sedan
PRICE AS TESTED \$24,815
BASE PRICE \$24,815
ENGINE TYPE: turbocharged and intercooled DOHC 16-valve inline-4, aluminum block and head, direct fuel injection
DISPLACEMENT 97 cu in, 1591 cc
POWER 178 hp @ 5500 rpm
TORQUE 195 lb-ft @ 1500 rpm
TRANSMISSION: 7-speed dual-clutch automatic with manual shifting mode
DIMENSIONS
WHEELBASE 110.4 in
LENGTH 191.1 in
WIDTH 73.2 in
HEIGHT 57.7 in
PASSENGER VOLUME 105 cu ft
TRUNK VOLUME 16 cu ft
CURB WEIGHT 3241 lb

▼ C/D TEST RESULTS

ZERO TO 60 MPH 7.3 sec
ZERO TO 100 MPH 19.1 sec
ZERO TO 130 MPH 41.0 sec
ROLLING START, 5-60 MPH 7.6 sec
1/4-MILE 15.8 sec @ 92 mph
TOP SPEED (redline limited) 134 mph
BRAKING, 70-0 MPH 185 ft
ROADHOLDING, 300-FT-DIA SKIDPAD 0.83 g
FUEL ECONOMY
EPA CITY/HWY 28/39 mpg
C/D OBSERVED 30 mpg

■ TEST NOTES:

Understeer and narrow all-season tires diminish peak cornering performance. Fade stretches stopping distances a touch.



That the 1.6-liter engine comes in only one trim level may be its main drawback. One step up from the base LX, the LX 1.6T is reasonably well equipped (Bluetooth, a backup camera, keyless entry), but if you want leather, seat heaters, or navigation, you need to climb up the ladder. The controls are straightforward, and outward visibility is good. The back seat offers abundant legroom and adequate headroom under the sloping roofline, and even a short-trip-appropriate middle position.

The 2011 model brought the Optima in from the subprime fringe of the mid-size-sedan market, and the redesigned model ought to keep it there. While not the most powerful or luxurious variant, the LX 1.6T may be its most interesting, offering painless frugality that should speak to price-conscious sedan buyers.



HATCHBACK



AUDI A3 e-tron SPORTBACK

A plug-in hybrid emerges from a plume of NO_x gas.
by K.C. Colwell

Detectives don't believe in coincidence, but the timing of the new A3 e-tron Sportback, in the wake of the VW Group's diesel scandal, is at the very least serendipitous. No way Audi could have timed this plug-in hybrid's release, inked on the calendar years ago, to coincide with a global meltdown over diesel cheating, right? If it did, we want Audi running our 401(k) portfolios.

Irrespective of timing and circumstance, Audi is doing its first entry-level hybrid right. Sold exclusively in four-door hatchback guise, the e-tron avoids the potential anonymity that swallowed so many same-bodied hybrid sedans. Also, it forces U.S. hatchback buyers to go hybrid; there are no plans for this miniwagon to be followed by other engine variants.

There is a modest plug-in premium, however. The e-tron starts at \$38,825, \$7,000 more than a front-drive A3 sedan or right about where a fully loaded Chevrolet Volt finishes. The extra cash buys all-electric driving, in roughly 17-mile increments, from an 8.8-kWh battery and a 102-hp electric motor.

Between charges, which max at eight hours while plugged into household 120-volt electricity or just over two hours on 240 volts, a turbocharged 1.4-liter inline-four delivers most of the drive torque. The

AC motor, which is integrated with a six-speed dual-clutch automatic, adds some thrust and harvests energy when coasting or braking.

In concert they are good for 204 horsepower and should yield a zero-to-60-mph time of about 7.5 seconds. Or, about as quick as the VW Golf TSI.

Set the hybrid mode to "Charge Battery" and the car will replenish its lithium-ion pack while driving. This isn't particularly efficient, but in some markets an EV-drive mode reduces or even nullifies some roadway tolls. "Hold Battery" keeps the state-of-charge constant.

Most drivers will keep the car in "Hybrid," where the A3 e-tron should get an EPA combined score of 35 to 39 mpg and at least 30-percent-better fuel economy than an A3 sedan. In pure EV mode, the e-tron tops out at 80 mph and is expected to deliver about 83 to 86 MPGe.

Neither range nor EV fuel economy comes close to the Volt's (53 miles and 106 MPGe), but the A3 is less stuffed with batteries. Its rear-center-seat position is not the clown accommodations the Chevy's is;

SPECIFICATIONS

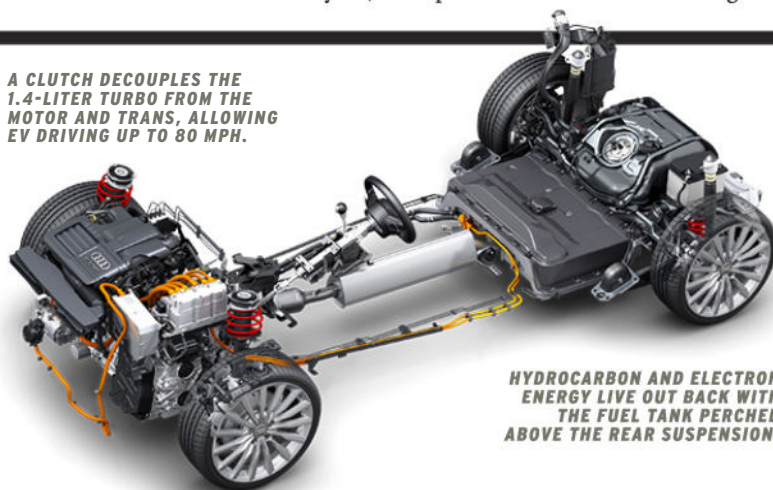
VEHICLE TYPE:	front-engine, front-wheel-drive, 5-passenger, 4-door hatchback
BASE PRICE	\$38,825
ENGINE TYPE:	turbocharged and intercooled DOHC 16-valve 1.4-liter inline-4, 150 hp, 184 lb-ft; permanent-magnet synchronous AC electric motor, 102 hp, 243 lb-ft; combined system, 204 hp, 258 lb-ft
TRANSMISSION:	6-speed dual-clutch automatic with manual shifting mode
DIMENSIONS	
WHEELBASE	103.5 in
LENGTH	169.8 in
WIDTH	70.3 in
HEIGHT	56.1 in
PASSENGER VOLUME	92 cu ft
CARGO VOLUME	14 cu ft
CURB WEIGHT	3650 lb
PERFORMANCE (C/D EST)	
ZERO TO 60 MPH	7.5 sec
ZERO TO 100 MPH	21.0 sec
1/4-MILE	15.6 sec
TOP SPEED	130 mph
FUEL ECONOMY (MFR'S EST)	
EPA CITY/HWY	33/37 mpg

three adults can squeeze back there while enjoying nearly two more inches of headroom. And the cargo area isn't cut off by steeply raked rear glass, as in the Volt. About the only concession to its hybrid system is the Sportback's spare-tire well, which is sacrificed to house a 10.6-gallon fuel tank, relocated from under the rear seat to make room for the battery.

Keeping the heavy battery within the wheelbase (the fuel tank is still above the rear suspension, though) begets the smooth and confident chassis performance we've come to expect from this small-car platform known as MQB. But there's nothing entry-level about the luxuriously damped NVH. Even the hand-off from EV to engine drive is undetectable. Our only dynamic gripe is a numb brake pedal that requires practice for smooth decelerations.

With long-haul seats and a ride some \$70K cars would envy, this may be the right car at the right time for Audi to keep greenies from leaving for other pastures. Whether it's enough to polish a tarnished reputation is another matter altogether. ■

A CLUTCH DECOUPLES THE 1.4-LITER TURBO FROM THE MOTOR AND TRANS, ALLOWING EV DRIVING UP TO 80 MPH.



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CONNIE KALITTA

Air-freight magnate and drag-racing legend Connie Kalitta, 77, looks back on his sometimes stormy but always high-flying career.

C/D: You certainly must be our only interviewee to have foiled a crazed hijacker.

CK: Christ, that was 20-some years ago. It was a guy who walked into my office and wanted to charter a Learjet to Washington, D.C. When we asked for a credit card, he opened his briefcase and pulled out a knife. At knifepoint, I led him into the jet but didn't lock the door behind us. I knew the police would come—or I hoped. So he climbed into the right seat, and I started the engines, just idling. That's when the state police parked their cruiser in front of us. Now the hijacker goes really berserk and I started wrestling with him to get the knife. I got cut up some. But before it got real bad, a cop pressed a gun to the guy's head.

C/D: We assume you're now in better health.

CK: Just had a knee replacement. So I have a problem walking. On top of that, I have a case of the gout. Bad gout.

C/D: What plane do you fly to the races?

CK: A King Air for nearby races. Also a nine-seat Falcon 20. And a Challenger for West Coast races. Dougie [Kalitta's nephew and lead driver] is our pilot. I wish I was as good as he is today.

C/D: How many planes are in your fleet?

CK: Around 100, including 30 747s, with 16 operating right now.

C/D: Are you ever tempted to walk into one of your hangars and say, "I think I'll fly to Rome today"?

CK: Nope. Not smart to fly these planes for no good reason. Next week, for instance, Doug and I have a meeting in Fort Lauderdale. We'll take a commercial flight. I used to own some hobby aircraft, but I got rid of them. I didn't have the time.

C/D: You're one of the few civilians with his own Air Force base.

CK: It's the old Wurtsmith base, near Oscoda, Michigan. But I don't own it. I lease it. Its purpose is for maintenance of my aircraft. I have 900 maintenance people.

C/D: How is your time split between the air-freight business and drag racing?

CK: Ninety percent business, 10 percent racing. I make sure to go into the race shop once a day.

C/D: What's your annual racing budget?

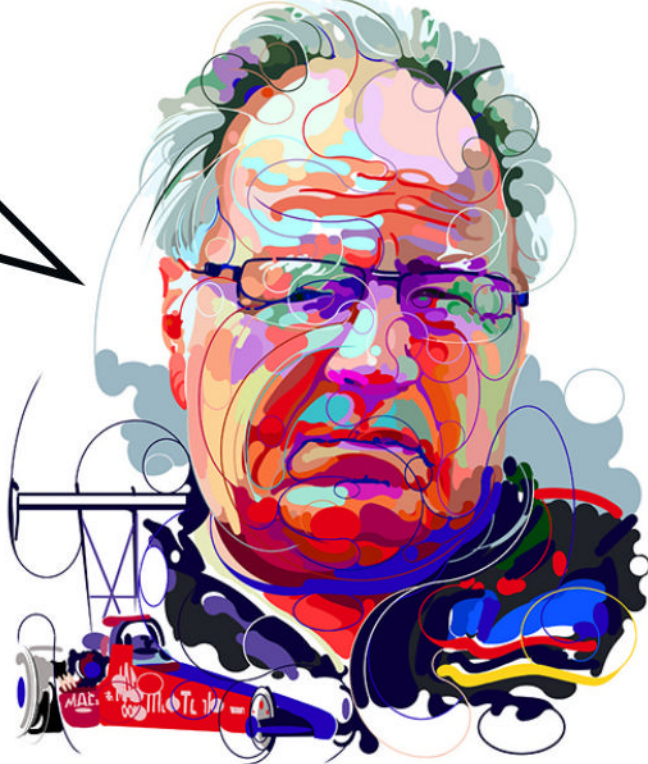
CK: Three million per car. And I have four cars. That doesn't include the support equipment. Each transporter rig, for instance, is worth \$1 million empty. I still have to add money from my own pocket.

C/D: Do you stay in touch with [former Top Fuel driver] Shirley Muldowney?

CK: Not at all. No communication.

C/D: Given your prickly association with Shirley, did you hesitate to take on Alexis DeJoria as your driver?

CK: No. I watched Alexis race her Alcohol Funny Car. I watched what she was doing—crashing. But she always climbed right back in, smiling. I liked that.



C/D: You have a reputation for being demanding. Maybe even mean. Is that fair?

CK: A lot of people have put that tattoo on me, but it's not the way I am. I'm easy with employees. I make sure they get credit for their work. Naturally, sometimes a guy will screw up, and I'll have to apply some "retraining."

C/D: You have only one working eye and one working ear?

CK: True. Good thing I have spares. When we went to zoomie headers that turn upward, there went my hearing. The noise juggled the brain in my skull. Maybe you noticed.

C/D: When your son, Scott, was killed, you must have said, "It's time to quit."

CK: I never thought of retiring. I'm a racer. So was he. It helped to find some answers to explain the crash. Turns out it was a fuel additive that blew up Scott's engine. So, NHRA now demands that it be 100-percent pure nitro. Also, many of our racetracks were built in the '60s—not much real estate for runoff. New tracks like Las Vegas, hell, you could drive off the end of that track and continue safely 20 miles into the desert. But there's not a day goes by I don't think of Scott. It's still traumatic.

C/D: After 60-some years of racing, do you ever arrive at a track and say, "I wish I were someplace else"?

CK: No. I want to be there. Don't have to.

C/D: Anything you'd have done differently?

CK: Nope. I've been happy with my life. Also very lucky. I lead two lives—businessman and racer—and it feels like the best of both worlds. — JOHN PHILLIPS

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illustration by **MARTIN SATI**

THE TALE OF THE ALL-NEW
2016 MALIBU

AS TOLD FROM AN ENGINEERING AND DESIGN PERSPECTIVE.

We sat down with designers Mike Pevovar and Crystal Windham, and integration manager Lance Johnstone to talk about the innovation that went into developing the next-generation Malibu.



Malibu Premier with 2.0L engine offers a GM estimated 32 MPG highway. Official EPA estimates not yet available.





MIKE PEVOVAR & CRYSTAL WINDHAM

EXTERIOR AND INTERIOR DESIGN DIRECTORS

In terms of design, what are some defining features of the all-new Malibu?

Mike: The Chevrolet Malibu has a road presence that balances form and function in a way that will turn heads. When creating the “new face of Chevy,” the grille, headlamps and daytime running lamps all laid the foundation for the expressive, windswept body lines. The design is assertive and confident, as emphasized by its solidly planted stance. Long, dramatically sweeping surfaces really make Malibu stand out from the crowd. The whole vehicle feels tidy and taut — something you could throw around a little.

Crystal: Malibu interior design is all about maximizing comfort with style. The instrument panel is down and away for more driver space, but the available touchscreen is up to 8 inches. We offset and slightly floated the screen to use space better. That’s pretty daring for this market, but glare and reach are optimized for a driver. Also, the softest materials are closest to the customers, and the details are outstanding — lots of inserts and accents of different textured leather appointments,

intricate stitching — it’s taking those expressive zones and adding more. We want to surprise people, not just the first time, but the second time, third time — like, “Wow ... they have this little pocket here for my umbrella!” and “Wow ... so this is what my car looks like at night!”

How do interior and exterior design elements of the all-new Malibu complement each other?

Mike: The extra 1.3 inches of rear leg room set the stage for exterior design — it stretched everything, so we used that to set up body proportions to make the vehicle look lower, longer and wider. Also, the sixth rear quarter panel window not only increases visibility and brings more sunlight inside, it helps make the car look lighter, more airy and more spacious from the outside.

Crystal: When you start with a solid exterior foundation with correct proportions, the interior design architecture comes together naturally, and we can focus on improving visibility and comfort. I always say the exterior draws you in, but the interior keeps you there. Drivers spend so much time in their car, so it should feel like a second home.

“We want to surprise people, not just the first time, but the second time, third time...”

Crystal Windham, INTERIOR DESIGN DIRECTOR



LANCE JOHNSTONE

VIRTUAL PERFORMANCE INTEGRATION MANAGER

The 2016 Malibu is quieter, offers improved mileage and better handling. How could you improve Malibu on so many dimensions simultaneously?

The key is integration — working with all of the vehicle components and vehicle teams simultaneously to create the lightest, best performing structure for the vehicle. The ultimate goal was to design Malibu with surprising MPG with less mass, but no reduction in performance. Integration allowed us to work through all of the consequences of using one part or another, and combining components. It allowed us to optimize more and compromise less, and it really paid off in the all-new Malibu. We were able to remove nearly 300 pounds from the vehicle — making it the lightest vehicle in its class, all the while offering an estimated 37 MPG highway.¹

What technologies aided in optimizing vehicle integration with the Malibu design team?

Computer-assisted engineering has progressed to the point where it allowed us to explore and virtually evaluate more design alternatives for the new Malibu than ever before. This gave us new insights by showing us how these alternative designs for the vehicle structure could improve performance across numerous different vehicle-performance dimensions. These internal structural improvements then paved the way for new external design considerations and possibilities. The engineering improvements optimized performance and mass, enabling MPG and also had an impact on the exterior’s great design.



¹ With 1.5L engine. Based on GM testing. Official EPA estimates not yet available.

Go Further



Ford FORD GT



Preproduction model shown. Available late 2016.